GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

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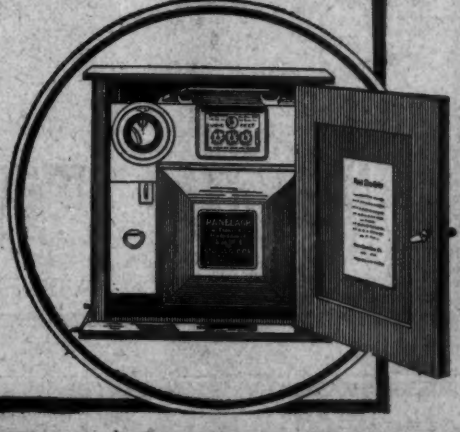

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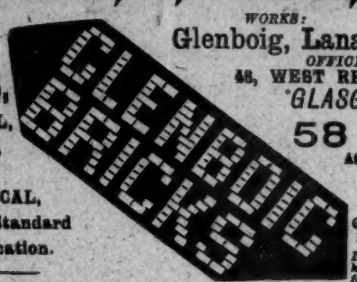

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VOL. CLXIII., No. 3150.] WEDNESDAY, SEPTEMBER 26, 1923. [75TH YEAR.

EDITORIAL NOTES.

The Bingley Hall Success.

THE Birmingham Corporation Gas Department and the Midland gas undertakings are reaping from the National Gas Exhibition now running in the Bingley Hall, Birmingham (of which we gave an extensive account last week), the reward for which they worked, and so are all who are taking part in the display. The attendance at the exhibition has exceeded the most sanguine expectations, and Saturday capped the other five days when the Junior Gas Associations and the members of the "B.C.G.A." Salesmen's Circles from all over Great Britain were in Birmingham in their hundreds. Every day through the week there have been visits from the managements of distant gas undertakings, some of the parties including representative consumers. There has even been a visitor from Manchuria who was anxious to see the latest types of gas-using appliances. Nobody from abroad interested in gas affairs who happens to be in this country at the present time will fail to find an opportunity to include Birmingham in his itinerary. One thing that people like about the exhibition is that it is not so large that it has to be passed through in a cursory manner; and it is not by any means small. It is just of a size which enables it to be comprehensive and representative; and the exhibitors are finding the advantage of this, as well as of the good planning which gives one the feeling that the place is not congested, and that there is ample circulating room. We spoke to several exhibitors on Saturday; and general satisfaction was expressed as to their first week's experiences.

Our own observation extending over several hours on Saturday proved a universal interest in the exhibits. The heavy goods manufacturers had gas men making inquiries and receiving explanations. The general illumination of the exhibition with lamps suitable for all sorts of space lighting is good, and was attracting notice. The lighting stands had men and ladies round them examining the modern artistic designs of fittings, with burners which give a high efficiency, and which are surrounded by shades of great variety and beauty. By the way, we are coming to the conclusion that the large "universal" burner is on the road of decadence. It is too large a unit. Smaller units are now more popular; and the little high-efficiency inverted or upright burners with small opal globes or shades, for places where light is wanted, but not for reading or working purposes, have obtained a very favourable reception. The educative displays in furnished rooms of the combined gas undertakings of the Midlands, those of the "B.C.G.A.," and those of makers of mantles and meters, are centres of great attraction. The cookery, bath-room, and hot-water demonstrations are magnetic. New cookers, which make the old types look antiquated and undesirable, are courting and obtaining much approval. Gas-fires receive considerable attention; the season is favourable. In this connection, it was particularly noticed that, while the numerous handsome designs of fires are admired, several visitors appear to be very keen on the small, well-finished, and withal cheap types, which are particularly suitable for bed-rooms and other apartments of moderate cubical capacity. The manufacturers are not slow to realize the way the wind is blowing. It proves the growing desire to extend the applications of gas in the home, and so realize the comfort of it, on as economical terms as possible, while doing so in a manner both attractive and pleasing. The big industrial furnaces, gas-engines, tools, &c., are receiving a large amount of investigation. In fact, from the main uses of gas to all the accessories of use that are to be found here, we find, in regard to interest and inquiries, a general verdict of satisfaction from those who are exhibiting. Picturesquely presented also are the advantages to field crops and other vegetation of the fertilizer produced by the industry, and graphically the remarkable productions that arise from the distillation of tar. The whole display is one vast demonstration of how to do things better than they have been done before, and by appliances that have left their precursors moving gradually into obsolescence, and finally to abandonment. This is progress and added stability.

Honour to whom honour is especially due. We were glad to learn from the Chairman of the Executive Committee of the Exhibition (Alderman John H. Lloyd, M.A.) and from his Deputy (Mr. A. W. Smith, General Manager and Secretary of the Birmingham Corporation Gas Department) of their high appreciation of the work of Mr. R. J. Rogers, the Fittings Superintendent of the Department, and of Mr. F. R. Ayres. They have been working seven days a week; and rumour says that in "the pushing-on" stages the hands of the clock passed over twenty-four hours of continuous personal activity. Mr. Rogers and his staff are to-day reaping the fruits of their great exertions.

Juniors and Salesmen in Birmingham.

IN the "JOURNAL," apart from the special reference and report in "THE GAS SALESMAN," there must be mention of the wonderful display of might and enthusiasm that the gas industry possesses in their juniors and gas salesmen, as witnessed at Birmingham on Saturday. To say that the big joint conference of Junior Associations and Salesmen's Circles surpassed our highest expectations is to put the matter mildly. The inflowing stream commenced on Friday evening, and was continued on Saturday morning with greater force. The members came from far North and far South; from East and from West. There was Glasgow near Southampton; and the men of Wales mingling with those from Lancashire, Yorkshire, and places on the East Coast. The Gas Light and Coke Company chartered a special train for 250 or so of the men in their gas service department. Chairmen and secretaries of Associations and Circles who had never met before joined hands on this occasion; and new friendships were formed among these men with common interests and common purposes in life, but ordinarily widely separated. A unity is being formed in the industry to a degree that has never before been achieved; and this increasing consolidation and intercourse are making of it a stronger organization than it ever was before. Such extension of the bracings and strengthening of the members of the industrial structure must have a universal beneficial effect upon its fortunes.

If the administrators and engineers and managers from all over Great Britain could have peeped into the Conference Hall at the Exhibition on Saturday afternoon, they would have seen a demonstration of enthusiasm that would have carried conviction that the organizations of juniors and salesmen are having an influence upon the work of the industry which nothing else could have promoted to such a high degree. There is an inspiration in it all—the inspiration that comes from the intermingling of varying personal qualities, thought, action, and experiences, and the rubbing together of shoulders by men with like objectives. This feeling was shared by Mr. F. W. Goodenough, as he faced from the chair (which he occupied as the Executive Chairman of the "B.C.G.A.") an audience filling all the seats in

the Conference Hall (some 600), with, in addition, all standing room occupied and men outside the doors. Alderman Lloyd was similarly impressed, and so were Mr. W. M. Mason and all the Chairmen and Secretaries of Junior Associations and Salesmen's Circles who occupied seats on the platform—representative of the coming executive officers and the existing developers of gas sales in Great Britain. It was a wonderful sight—a wonderful experience. For over two hours that great audience listened intently to the words of wisdom which fell from Mr. Goodenough, to the explanation given by Mr. Walter Hole of the educational schemes for the young men of the industry, and to the speeches from representative juniors and salesmen of the industry, which were eloquent of ambition and desire for success in the work to which they and their fellows have put their hands.

Let nothing be done to throttle this great movement, or to thwart the manifest wish to grow in useful service to the industry. On the contrary, let there be the maximum possible encouragement, at both the gas service and manufacturing ends of the industry. Let it never again be forgotten, as it has sometimes been in the past, that development of the industry has its inception at the sales and service end. Saying and emphasizing this is a sufficient indication of the view that there should be as much concentration at that end upon all contributory methods that advantage gas service and sales as there is upon the work at the manufacturing end. Therefore it is that we hope gas administrators and chief executive officers will make possible a view which we found pretty general on Saturday, that the great and gratifying experience of that day should be regarded as inaugurating annual joint conferences of the gas salesmen of Great Britain. We hope it will be so.

An Alloa Scandal.

A MORE flagrant piece of injustice than that which has been inflicted upon the gas consumers of Alloa it has never been our lot to meet during the many years the affairs of the gas industry have been under our observation. We thought that the somewhat similar case of Paisley, upon which we commented on Aug. 12, 1919, was bad enough; but this one at Alloa is infinitely worse. In the Paisley case, the charge for gas was raised in order to pay about two-thirds of the heavy losses incurred by the electricity undertaking the previous year. In the case of Alloa, it has been decided to raise the price of gas by 7d. per 1000 c.ft.—from 2s. 11d. to 3s. 6d.—in order to liquidate accumulated losses by the electricity undertaking, amounting to no less than £32,446, and the estimate is that there will be a further loss of £3000 during the current year. It is coolly calculated that the gas consumers will have to pay the additional 7d. per 1000 c.ft. for a period of at least seven years in order to wipe off these losses, and to preserve the competing concern. Clear it is that there is no prospect of the electricity undertaking making good unaided. But the course that is being taken is a scandalous piece of work, amounting to sheer robbery of the gas consumers. The fact is that the Town Council have, during the past four years or so, got themselves into a bad financial mess over the electricity undertaking; and they do not know how to get out of it other than by recourse to the Electric Light (Scotland) Act of 1890, which, in the schedule, most inequitably provides for gas profits being appropriated to satisfy deficits on an electric lighting undertaking. Such an unjust provision ought never to have been passed by Parliament; and not until it is abrogated will justice in this respect be restored.

This case at Alloa, we venture to think, presents a condition of things that could never have been contemplated by the Legislature when the Act of 1890 was passed; and this same case supplies the strongest possible reasons for the repeal of the provision then made, which enables such a burden as something like £40,000 to be placed upon the shoulders of the gas consumers, including the poorer section of the community—the prepayment consumers—who account at Alloa for fully 50 p.ct. of the gas sold. Who are to protect these consumers against the more affluent electricity consumers if the Town Council do not? Such a burden as approximately £40,000 could not have arisen by any other means than inefficient administration by the local governing body of the affairs of the electricity undertaking. It is all very well to say that depression of trade has caused this and that to happen. Depression of trade has a common incidence upon undertakings supplying the needs of industry; it does not select one concern more than another to be the victim of its repressive action. It is all very well, too, to say that the maximum price (for lighting only) has been reached, and that the electricity undertaking can go no farther. There have been, and are, ways and means of getting maximum prices revised to a point at which electricity undertakings can exist. Even if power consumers say they will not pay a sufficient price to meet the costs of the service rendered them, and threaten to instal private generating plants, that is no reason why the patrons of another undertaking should find the money for satisfying their requirements. But here we have the spectacle of the price of gas going up 7d. per 1000 c.ft. for the set purpose of liquidating the debts of the electricity concern, while the electric power users are to have a rebate of 15 p.ct.! Has anyone ever seen anything more grotesque in modern local government? If so, we should like to hear of it. Another interesting fact is that the Electricity Commissioners and the Scottish Office—having behind them the authorization of what they must recognize as the unjust provision in the schedule of the Act of 1890—have "approved" of the course being taken. They must have felt it was rather an undignified thing to have to give "approval" to such an obvious piece of inequity.

Another aspect of this matter is that while one undertaking has been pursuing a course that has caused a large accumulation of losses, the one that has to bear the burden of administrative ineptitude has been carried on in a way that is a notable example of good management. It is small encouragement to good management to have the fruits gathered, and an inequitable impost made upon the customers of the undertaking, in order that large sums of money may be transferred to the relief of the competing concern. The gas undertaking has had—in the same way as many other business concerns—to bear all the abnormal burdens of war time and since; and those burdens have been sufficiently discouraging, without the present one. Up to 1919, the Gas Engineer and Manager (Mr. J. W. Napier) had the electricity undertaking under his charge; and it must be anything but satisfactory to him to have his old second charge which was removed from his custody coming back to him for succour, and, for seven years or so, robbing his own customers of their legitimate rights, for the safeguarding and improving of which he and his Committee have been diligently working. We have examined the data as to last year's operations. In every particular—gas made and all the secondary products—the results are such as to be envied by many undertakings in a superior position in respect of conditions; and the surplus net profit is such that the gas consumers would have been able, if this impost had not come upon them, to rejoice in a reduction of price this year. Instead of this, there is to be the increase of 7d. per 1000 c.ft. for seven years! We sympathize with all concerned in the administration of the Alloa Gas Department. Apart from the absurdity of making an undertaking pay the losses of its competitor, it is a wrong principle in local government to put a super-tax on one section of the ratepayers (in this case the gas consumers) to defray losses that should be equally distributed among the ratepayers. It was bad for the Town Council to allow such an accumulation of losses on their electricity concern. That alone is enough to make people look at Alloa in surprise. The manner in which those losses are to be discharged is enough to turn the surprise into positive disgust.

Some Current Topics Examined.

A PRESIDENTIAL address which gives plenty of food for thought was given by Mr. J. Kelly, of Bridlington, to the North of England Gas Managers' Association last Friday. It is a good thing perhaps for one's philosophy occasionally to receive a shock; and for one's general conclusions to meet with a substantial fact which proves that the opposite may legitimately be the case. Such shock and such fact show that it does not do to allow beliefs to have their basis solely on generalities; they also induce us to recommence consideration and to deepen reasoning, with the view to ascertain the why and the wherefore of the contradiction to our preconceived opinions. We come up against one of these contradictions almost immediately on starting to read the address. For a works such as those at Bridlington, producing upwards of 200 million c.ft. of gas per annum, we should have said that, with labour costs as high as they are to-day, the use of retort-charging machinery would have been an absolute essential to low costs of production and a

low selling price. While it may be true that there are "no novel or extraordinary engineering features" about the works, it is somewhat of a novelty to-day for works of such a size to be running under hand-charging. Nevertheless, for some years up to 1919, the price of gas was 2s. 3d.; and then it rose to the peak price of 3s. 6d. for a few months. The price of gas has fallen by degrees to 7d. per therm—the equivalent of 2s. 11d. per 1000 c.ft. An old practice and low prices are therefore not strangers here. The question is whether, at to-day's costs of labour, Mr. Kelly could do any better with charging machinery and the capital charges they involve. He makes no defence of continuing the old practice; nor does he directly tell us what are his views as to the retention in circumstances at Bridlington of hand charging in comparison with machine work. The fact that there is retention indicates that there are very good reasons for it—either retort-house conditions not being favourable, or a conviction that in the existing circumstances the change would not result in any real financial advantage. There is another feature about the manufacturing operations presented in the address. It is the statement that the yield of gas per ton of coal carbonized over the past two years (excluding the therms derived from the gas oil used) has been 88 therms. This apparently includes the therms made from the coke used in the carburetted water gas plant. But, if so, we do not notice that Mr. Kelly supplies the figure as to the coke he has for sale per ton of coal carbonized. Such details, which complete the story, are interesting and helpful to those who make a study of working results. However, incidentally it is not to be wondered at, in view of the price, that gas is supplied to such a large proportion of the houses in the area. The number of houses is about 4380; and at the end of last year the number of consumers was 4286. If those consumers could all be regarded as houses, they would represent no less than 97·83 p.ct. of the former. This is a condition of things of which few gas-supply areas can boast; and it is a figure of which Mr. Kelly may well be proud—especially when, supplementing it, it is found that, excluding privately-owned cooking appliances, the Company have no fewer than 3000 gas cookers and grillers on hire. This is a very high ratio.

Turning from Bridlington to more general affairs, the President commented on two matters concerning coal—quality and cost influences. Respecting the former, there has been trouble enough in the gas industry through the inefficiency and uneconomy produced by the large proportion of ash and moisture that became so prevalent and grew so alarmingly in strength during the war and subsequently. Mr. Kelly admits that there has been improvement; we know that strenuous efforts have been made in some quarters to effect it. There has, however, been a regrettable tendency in certain cases—though not in all—to lapse from the virtuous path to an increase in ash content and a decrease in valuable constituents at a time when spot and export prices exceed contract ones. We will not suggest dishonourable practices; but it does seem to be the case in some instances for the regular customer, with a fixed contract price, to be made the victim in respect of quality when circumstances allow of higher prices being obtained for coal of greater refinement. The reverse should be the case, and it is so with some collieries who appreciate the value of constant customers and demand. Maximum percentages for ash and moisture should be a condition attaching to every contract; and variations from those percentages should be the subject of a sliding-scale of price. But there are collieries that refuse to be bound by such terms, though common in other lines of commerce. One trouble resulting from such conditions is that they provide extensive ground for disagreement and wrangling; and the circumstances of coal use on gas-works do not provide a very large margin of time for the settlement of disputes between the two parties to a coal contract. But it ought to be possible to devise some means to ensure that an agreed maximum figure as to inerts is not exceeded in contracts; and the same with moisture. Gas undertakings do not want to pay for water any more than for rubbish in the coal.

A related question is that of the cost of coal; and the President appears rather to doubt the efficacy of the sliding-scale arrangement which regulates profits between miners and the coalowners, under the agreement entered into at the end of the great strike. He finds it defective in that it does not incorporate as a factor in the slide the price of coal to the consumer, as is the case in gas supply. In the coal sliding-scale, there is no incentive to reduce the price to the consumer; there is nothing but competition or over-production that can bring down the price, and coal competition, except for foreign business, is something that is practically non-existent here. The sliding-scale may be in some coal districts an inducement to reduce the costs of production by increasing the output per man-day; but it has been ineffective in others, where it is thought additional profits should be obtained from the consumer, and not by the augmented efforts of the men. But the fact remains that the greater the margin between the producing costs and the price to the consumer, the greater the balance for division between the coal owners and the miners. The President points out that practically the same reasoning will apply to the conditions in the railway world. Of course, it must be admitted that both coal prices and railway rates have descended considerably; but the charges are still at figures which are too high for the welfare of the country. With the President's concluding view in this connection, there will be universal agreement. "It will," he says, "be a "happy day for the world when the interests of buyers, "sellers, and workers in all industries are common, in the "production and sale at the lowest possible price of all the "necessaries of life, as is the case with gas in the industry "in which we are engaged. Would that it might even be "thought probable that the day will be seen!"

The efforts that are being made in so many directions at the present time to increase the technical efficiency of gas production by the system of so-called complete gasification, are also referred to in the address; and Mr. Kelly utters a caution against unreservedly accepting all claims to advances in the efficiency of gas production. He makes a point which has been frequently made in the "JOURNAL," though not so neatly, when he says: "There is a technical "efficiency and also an economic efficiency in all systems; "but the two do not always by any means coincide." That is very true. But to the measurement of economic efficiency no general rule can be applied; it must always be subject to local circumstances, as economic conditions vary in every district. The President treads on polemical ground in dealing with the question of total gasification; but he presents well the trend of technical thought in this connection. Except by the use of oxygen, he says, it seems improbable that any internally fired plant can improve very much on the efficiency of the ordinary water-gas plant with the waste-heat boiler. Does he mean here a blue water-gas plant or a carburetted water-gas plant? For the efficiency of oil-gas production in the latter is very high. If he means a blue water-gas plant, with the over-all efficiency of the process improved by (say) 8·5 p.ct. by a waste-heat boiler, then the position changes somewhat. This leads him to the view very generally accepted to-day that possibly the most immediately promising course is to attempt to utilize the sensible heat of water gas for carbonizing coal by some system in which the retort is heated both externally and internally; always bearing in mind that technical efficiency may be dearly bought at the expense of economic efficiency. But apparently he finds the possibilities of advance in technical efficiency has been so narrowed that there is not now the scope for it that there has been in the past. But it is a duty to realize all the thermal efficiency possible, having regard to the cost of doing so, in order that it may be applied where economic conditions favour. We can picture circumstances where economic conditions might be improved by the application of the highest possible thermal efficiency in gas production.

We are glad to have endorsement by Mr. Kelly of the protests (in which we have joined) against the alteration of Standing Orders which threatens to make, where there is opposition, procedure in obtaining Special Orders more costly than applying for Special Acts. In the interests of gas consumers, endeavours should continue to be made (they have been made by the National Gas Council) to secure a reversion to the simplified procedure that was obviously intended by the Gas Regulation Act. An alternative is that vexatious or frivolous opposition ought to be discouraged by not permitting an unsuccessful opposition to a Draft Order to be charged against any public fund or included in any rate. This is a suggestion which Parliament is not likely to subscribe to for various reasons; but the extended liberty in opposition is something that is wrong and cumbrous, and should certainly be curtailed. The address is, as would be expected from Mr. Kelly, good in all its parts; and we have been interested in every line of it.

The Future of Sulphate of Ammonia.

THIS is a question of considerable significance to the producers of the bye-product material. The market value of sulphate of ammonia has been falling substantially, while the quality has had to be raised; and both conditions were necessary to the maintenance of business. Poor prices are, in consequence, being obtained for ammoniacal liquor. One reason for all this is the plentiful supply of nitrogenous fertilizers that there is in the world to-day, and the extension of the means of production. Without being pessimistic, but looking facts squarely in the face, there are all the omens—and to spare—that the position in the future, unless (which is not likely) demand will oblige by keeping pace with output, will be more serious than at present. But there is this about the gas industry—although, till latter years, it did not have much recourse to the aid of science, it has always shown an ability to adapt itself to new circumstances, and to struggle through successfully. But that is now changed. The industry is organized even in respect of sulphate of ammonia; and science is brought to bear upon all its doings. System in operation, technical and commercial, has given place to the crude manner of accomplishing things. The Sulphate of Ammonia Federation have an excellent intelligence department (if we may so call it), and know precisely what is taking place with fertilizers all over the world. The policy of the Federation, in view of the present competitive position, is the giving of good value for money, comparatively with other fertilizers; and in this they are very successful, though there are rueful faces over the prices being asked and secured. No doubt the experts of the Federation will be looking into the question of converting gas liquor into other compounds. Probably they are already so engaged, and the time may not be ripe for saying exactly what they are doing. But if they are not, then it seems that the time has arrived when, in this relation, the industry should be "getting a move on."

An extremely appropriate and opportune paper on the subject was that which Mr. R. C. Taylor, B.Sc., of Bridlington, submitted at the meeting of the North of England Gas Managers' Association last Friday. The paper (which, with the report of the discussion, we shall publish next week) divides itself into two parts—a consideration, first, of the processes for the utilization of atmospheric nitrogen, and, secondly, of those things which ought to be done for our future salvation as producers of ammonia; one thing being that we should, if possible, get rid of sulphuric acid, which is costly, while the sulphate radicle, being practically useless for manurial purposes, presents agriculturists with the additional expense of maintaining a non-acidic soil, so essential to the growth of crops. However, this by the way. In the first part of the paper, Mr. Taylor submits a clear review of the atmospheric nitrogen processes. Their position, examined from the standpoint of British makers of sulphate of ammonia, is put in a nutshell. He divides them into three groups. From the first two—the conversion of nitrogen into nitric or nitrous acids, and the conversion of atmospheric nitrogen into compounds that readily yield ammonia—it is plain we have not so much to fear as from the systems of Haber and Claude, which are based on the direct synthesis of ammonia from atmospheric nitrogen and hydrogen. These two synthetic processes are independent of geographical conditions, provided the hydrogen be made from fuel. In other words, they can be adopted in any country, quite apart from all question of costs of power and material. Mr. Taylor also directs attention to another means of fixing ammonia which has received much investigation on the Continent—that is, the conversion of ammonia into urea, which, used in combination with superphosphate of lime, has had large application in the French vineyards. Pure urea contains 46·7 p.ct. of nitrogen; and it is not deliquescent. A certain amount of chloride of ammonia is also now being produced as a fertilizer.

This all goes to indicate that the future for sulphate of ammonia is not going to be plain sailing and free from trouble. But Mr. Taylor, as a result of his review, maintains a strong hopefulness. It is true the demand for fertilizers is increasing in this country and abroad; but the paper is alive with facts which suggest the output of fertilizers outstripping the demand. Patronage will very much depend upon the cost of production, suitability of material to soil, and cost of transport to the user. Bye-product ammonia will always have to be produced; but in connection with sulphate there are factors which will present themselves readily enough to the agriculturist when he compares the product (say) with urea, containing about twice the percentage of nitrogen, and other advantages named in the paper. A point in favour of the synthetic products is their purity. Hence the suggestion that gas engineers should consider the advisability of applying possible methods of converting gas liquor into compounds of the nature of urea, nitrate and phosphate of ammonia, &c., with the view of restoring the financial return from ammoniacal gas liquor which has fallen off so considerably. That is sound advice.

PERSONAL.

We are pleased to learn that Mr. CHARLES CLARE, who is the firm's Managing-Director in London, was, at a recent meeting of the Board, unanimously elected Chairman of Messrs. Fletcher, Russell, & Co., Ltd., in succession to the late Mr. T. W. Fletcher.

An interesting presentation to Mr. E. FOWLER was made at the Reading Gas-Works on the occasion of his retirement from the position of Chief Inspector, which he has held for the past 26 years. The presentation consisted of a handsome armchair subscribed for by the members of the staff, and also a clock presented by the men employed in the fittings department. Mr. L. A. Rumble, in making the presentation, regretted the absence of Mr. Douglas H. Helps (the Engineer and Manager), who was away on holidays, and referred in eulogistic terms to the inspector's services to the Company. He had always been a loyal and faithful servant, and would be greatly missed both by the men who had served under him and by his colleagues on the staff. They all joined in wishing him many years of health in which to enjoy his retirement. After some other speeches, Mr. Fowler feelingly acknowledged the gifts.

OBITUARY.

The death has occurred, at the age of 77 years, of Mr. HORNSBY JACKSON, a prominent personality in public affairs in Wharfedale, Yorkshire. His business activities in Airedale and on the hills between the two dales included the Chairmanship of the Calverley and Horsforth Gas Company.

ELECTRICITY SUPPLY MEMORANDA.

THE electrical people have already taken notice of the discussion on the lighting load at the meeting of the North British Association of Gas Managers. Naturally they are not pleased that gas men are talking more and more of the ways and means of protecting that part of their business which has proved the most vulnerable for the competitor. There is nothing they would have liked better than for apathy and neglect to have continued, and for gas lighting to have been left to the inexpert and careless user, with all the inefficiency he or she permits. The electrical competitors have noted, not without some fear, the repeated attention that has been given to the subject at meetings of gas engineers since Dr. Carpenter read his paper before the Institution of Gas Engineers. They see in this an awakening; and what it means for them is that, if those gas undertakings that have been negligent, seriously take up this work, the position will become much more difficult for them. Sneers are cheap and easy things; but the electricians are not so foolish as to be unable to recognize, covertly if not openly, that gas lighting has virtues, and that it is not so harmful as their own lights, unless these are, by expensive means, totally enveloped. The whole of the gas industry has not been asleep in this matter; and electrical salesmen know full well when this is the case lighting business is for them more difficult to get than in those places where the reverse prevails. The gas-lighting business is worth protection and retention. There are ways and means of doing this, and not only so, but of recovering some of the lost ground, and extending into new business. Then let all gas men be up and doing in this direction. As before pointed out in the "Memoranda," the electrical people are putting much weight just now into the lighting business, for the reasons that, after all, they find it pays them best, and it may be the inlet to other business.

Eyes on Gas Lighting.

Glare in Industrial Lighting.

It was a good subject that Dr. G. H. Miles, of the National Institute of Industrial Psychology, brought before the annual meeting of the British Association. It was that of glare in lighting; and it is to be hoped that the paper will have good circulation among our manufacturers. We shall be publishing some extracts from it in an early issue of the "JOURNAL." It has been proved beyond question that an increase

of illumination, properly applied, does produce a beneficial effect upon the volume of output of work. But the provision of an increased amount of light is a matter upon which some very crude notions all too largely exist, and which, when applied, bring cumulatively unexpected harmful consequences in their train. Those who read Dr. Miles' paper will see how intense, highly concentrated, lights affect workers. It is no use trying to augment output by increasing the amount of illumination if, simultaneously, one is going to raise the percentage of error in the work through promoting defects in vision. Dr. Miles has carried out some experiments, in which he finds that the after-effect of light stimulus has a considerable influence upon the accuracy of the work. In some subjects as much as 25 p.ct. increase in error was noticed. Of course, as might be expected, there are individual differences; and in one case only 4 p.ct. increase in error was observed. Another thing that is manifest, too, is that standards of foot-candles are not in themselves a reliable guide as to the adequacy or suitability of the lighting. This might be complied with by a very powerful central light. But the ratio between the intensity of such a light and the average intensity of the light received from the surroundings would be large. In such circumstances, direct light, or light received from the polished surfaces of metal tools, would at once give rise to glare effects and objectionable after-effects. If, however, instead of one powerful centre light, a larger number of lights of less intensity, but giving in the mass equivalent surface illumination, were used, then the ratio between the intensity of any one of them or the light reflected from polished surfaces and the average intensity of light received from surroundings, would be much less, and the possibility of glare effects would be greatly diminished. Dr. Miles put it all in small compass in this way: That the use of high-powered sources of light, especially when of small area—such as an unshaded filament or a too small frosted globe—increases liability to accident through direct temporary blinding, or the still more dangerous formation of unrecognized blind spots; that unless well distributed, they gave rise to too big a difference between the source of illumination and the average intensity of the light reflected from surroundings, with liability to the formation of projected images which produce unnecessary irritation and distress to the eyes, and impair the accuracy of work. Illuminating engineers should note these points, electrical engineers with their lamps of high intrinsic brilliancy should not neglect them, and factory inspectors should add them to the knowledge of lighting that they have gained during recent years. Otherwise, the time will come when the important question will be, not the increase of illumination in factories, but the prevention of further ill-effects on work and output of depreciated vision. This will be the more difficult problem.

Spectacular Lighting at Wembley.

Electric lighting will make a big display at the British Empire Exhibition next year. According to the "Electrician," hundreds of miles of electric cable are now being buried in the grounds at Wembley. One of the novelties, it is stated, will be that the illumination will change with the weather. The aim will be to produce a broad luminous effect which will light-up the buildings, and emphasize the beauty of structure and outlines, and, in addition, harmonize with the change of temperature. Achievement will be by an elaborate scheme of colour lighting. On a cold night the whole exhibition will radiate under a warm orange or red glow; on hot, close evenings the lighting will change to a cool moonlight effect. In every case, the source of the light which illuminates the buildings will be concealed, "thus preserving the illusion of artificial sunlight or moonlight." And still more: The main avenues and roads will be lighted up by globes 2 ft. in diameter, mounted on stone columns 10 ft. high. These also will change in harmony with the rest of the lighting. Perhaps the most wonderful of all the lighting schemes will be that employed in connection with the ornamental lake, which stretches from east to west across the centre of the main exhibition grounds. The only lighting on the lake will be from four floating boats, which will project powerful beams of coloured light below and along the water's surface. The beams of light below the water's surface will be caught by mirrors on the bed of the lake, and reflected upwards at various angles. At night a certain amount of mist always rises from a large expanse of water. Full advantage will be taken of this; and the various beams of light passing through it will give the illusion of an incandescent lake, on which visitors may float in various craft typical of those employed in different parts of the Empire. The sky will also be used by powerful beams of light. There will be a perpendicular beam of light 200 ft. sq.—many times greater in intensity than all the searchlights which were used during air raids on London put together. Gas willingly acknowledges the supremacy of electric lighting for spectacular displays of this kind.

Demonstrating Electric Cooking.

One sometimes picks-up wrinkles from a trading rival. It is not necessary always to have a large imposing exhibition for the purpose of a local demonstration. Small demonstrations in suitable premises will serve quite a useful purpose, and will pay as advertisements. They are not costly; and they can be held at different periods of the year, and fairly frequently. The large exhibition is valuable, as it can be made more attractive, an extensive assortment of goods can be shown under various conditions, and demonstration is of a more striking character. Small exhibitions may constitute the links between the big, concentrated, diversified displays. At Liverpool, there has recently been a demonstration of electric cooking apparatus at a café; and the products of the demonstrations have been on sale. The display was made under the auspices of the Corporation Electricity Department, and was the result of the interest that had been aroused among the members of the Liverpool Caterers' Association. While cookers and ovens were shown at work, it is said by "Electrical Industries" that chief interest was taken in the Westinghouse automatic commercial electric bakers' oven, which rests on a base of 7 ft. 3 in. by 3 ft. 2 in., and stands 6 ft. high. This oven will cook 160 1-lb. loaves at one bake; and as the bread was taken from the oven, it was put on sale. It is fitted with six heaters, each loaded at about 4·2 KW., making a total loading of approximately 25 KW. Under favourable conditions, this oven, it is said, can be operated continuously at a charge of from 1s. 6d. to 2s. per hour. Features of the oven are: Uniformity of baking due to automatic temperature control, and baking is automatic. Heat is supplied by passing electricity through a wire or ribbon of special metal, which resists the flow of electric current, and in doing so attains a red heat.

Electric Washing-Machines.

According to "Megohm," writing in the "Electrical Times," although great efforts have been made to create a demand for electric washing-machines, they have not "caught-on" in this country. He attributes this to their cost; and he is not surprised that electricity consumers are disinclined to pay between £30 and £40 for a device which merely saves a small amount of labour on washing day. What is true of washing-machines is true of many other appliances of electrical origin. Apart from cost, it is interesting to notice how many things are described as "electric" when a small motor drives them. Even our hairdresser advertises that his customers' hair is brushed by electricity. All the electricity about the business is found in the small motor seated on a bracket on the wall, which operates a shaft running the full length of the "saloon."

CHEMICAL TOPICS FROM CURRENT LITERATURE.

Monthly Notes from Recent Technical Publications.

By H. J. HAILSTONE, F.C.S. (Rochdale).

EXAMINATION OF REFRACTORY MATERIALS.

A method for the examination of fireclays, &c., is described by A. L. Carter in the "Transactions of the Ceramic Society." According to this method, samples of the materials are finely ground, moistened with dextrine solution, and placed on a fireclay trough to dry. A similar test piece is made up from a Segar cone of known melting-point; and this is heated by means of an oxy coal-gas flame adjusted to give a degree of heat sufficient to melt the test piece. The behaviour of the various prepared samples, when similarly heated by the same flame for equal periods, gives a relative idea of their values as heat resisters, and also an indication of their comparative shrinkages.

WATER TREATMENT.

A booklet on this subject has been issued by Messrs. Brunner Mond & Co. wherein various important points in water-softening practice are dealt with in a most lucid fashion. The chemical principles underlying the reactions taking place during softening operations are given, and the particular significance of calcium and magnesium salts is described, together with the respective methods by means of which these impurities may be eliminated. The lime-soda process receives most attention; and its correct application to the problem of the removal of temporary and permanent hardness is made clear. It is, I think, general experience that magnesium salts are the most troublesome in the steam-boiler—both as corrosives and as incrustants—and are certainly not easily removed unless careful control is exercised over the softening process. In this connection there is given an important explanation regarding temporary hardness, which shows why magnesium bicarbonate requires twice the amount of lime for its removal than is needed by an equivalent temporary hardness due to calcium bicarbonate. A number of important considerations are enumerated which influence the choice of suitable plant for water treatment.

DISTILLATION OF PHENOL AND CRESOLS.

As a result of the study of the action of phosphoric acid on various organic compounds, M. Melamid and E. Rosenthal, writing in the "Zeitschrift für angewandte chemie," state that crude phenol and cresol yield colourless distillates when distilled over phosphoric acid. The action is probably somewhat akin to that of sulphuric acid, though much milder in effect, and doubtless will obviate the excessive formation of objectionable volatile sulphur compounds and gases such as is referred to by Lunge in his "Coal Tar and Ammonia." More information on this matter would be useful, together with some idea as to the length of time the fresh distillates remain colourless.

SOLUBILITY OF WATER IN BENZENE.

By the use of a special flask having a graduated neck and consisting of two bulbs of specified capacity connected by a narrow

graduated tube, A. E. Hill ("Journal of the American Chemical Society") carries out determinations on the mutual solubility of various liquids. Measured volumes of the two liquids are introduced into the flask, and are shaken at the desired temperature. Readings are taken after the liquids have settled; and the mutual solubilities for the particular temperature may be calculated from the data obtained. Another method described depends on the increased solubility of silver perchlorate in organic liquids when water is present. The application of this method is, of course, restricted to those liquids in which the silver compound is soluble. Results given of experiments made with benzene saturated with water show that 0·054 p.ct. of water was present at 15° C.; and this figure increased to 0·23 p.ct. at 65° C. This increased miscibility of benzene and water at higher temperatures is often noticed when conducting works tests; a turbid sample fresh from the works rapidly becoming clear as soon as the temperature is raised for laboratory distillation.

Analysis of Fuel Oils.

The separation of coal-tar oils from mineral oils may be accomplished by the use of dimethyl sulphate, in which solvent the aromatic constituents are soluble, whereas paraffinoid oils are not. D. Holde and S. Weill, in a contribution to "Brennstoff Chemie," state that moist aniline behaves similarly in this respect. The insoluble mineral oils, petroleum, or asphalt distillates, retain traces of aniline which may be subsequently removed by treatment with a dilute acid, such as hydrochloric. It is obvious that the use of aniline will be a cheaper means of making such separations; and the risks attending the use of the highly-poisonous dimethyl sulphate will be avoided.

The Viscosity of Oils.

A report of experimental work done by two Japanese investigators is noted in the "Journal of the Chemical Society." Particular reference is made to the determination of the viscosity of lubricating oils at low temperature; and a number of oils and mixtures were tested at temperatures down to −18° C. Glass capillary tubes were used, and the oils passed through under suction and by compressed air. From the results obtained it was found possible to express the relation between the coefficient of viscosity and the temperature of the oils by a formula. In certain cases, however, irregularities occurred; and these were found to be due to the formation of solid particles at the low temperatures.

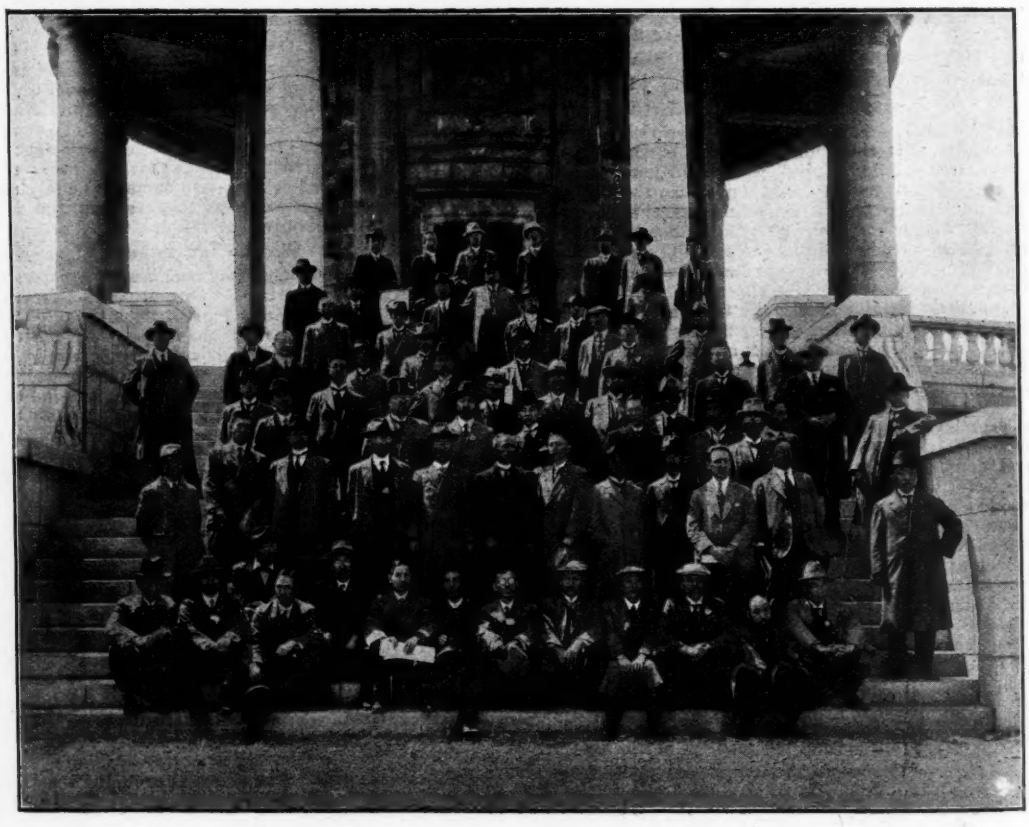
Deterioration of Standard Thiosulphate Solutions.

The deterioration of solutions of sodium thiosulphate on keeping necessitates frequent checking and restandardization. In order to retard decomposition, it is customary to use dark glass bottles or to black-varnish the ordinary glass bottle containing the solution, so that the action of light may be prevented. The mechanism of the chemical changes is discussed by E. Abel (Berichte), who points out that the deterioration ceases after equilibrium has been brought about, and that old solutions become fairly constant in their diminished activity. For making up fresh solutions the use of distilled water from glass apparatus only is advised; and every precaution must be taken to obviate any possibility of contamination with the slightest traces of copper, for this impurity causes solutions to deteriorate very rapidly.

Publicity.

The issue of the first "Gas Industries Number" by the "Manchester Guardian" cannot pass without a note in these columns. The bearing of chemical knowledge and practice upon the study and utilization of coal is well brought before the public in several of the articles. Though the matter is intentionally of a popular nature, all gas-works chemists may read with advantage Prof. Cobb's articles on "The Notion of Efficiency" and on "Coal Conservation," dealing with some vital facts underlying the future development of our industry. The analysis, constitution, and classification of coals receive, in various sections, the attention of Dr. Marie Stopes, Dr. Parker, Dr. Lessing, and the Chemical Department of the South Metropolitan Gas Company. Dr. Stopes briefly describes, in very happy style, the microscopical examination of coals and the identification of the four main ingredients—fusain, durain, clarain, and vitrain.

GAS INSTITUTE OF JAPAN.



At the present moment, when so much sympathy is being manifested in this country with Japan in the appalling disaster which has overtaken her, particular value attaches to the accompanying photograph, which, it should be said, has been kindly forwarded to us by Mr. C. B. Tully.

The photograph is of members of the gas industry of Japan, it having been taken at the meeting of their Gas Institute last summer. Mr. Tully's son, Mr. E. B. Tully, was present as a guest, and is third from the right on the second bottom row. Mr. Kubo, the Manager of the Kobe gas undertaking, is on his left.

NATIONAL GAS EXHIBITION.

BINGLEY HALL, BIRMINGHAM.

SEPT. 17—OCT. 3.

[An account of the Exhibits was published in the Special Number issued last week.]

A VIEW AT THE OPENING CEREMONY.

The National Gas Exhibition at Bingley Hall, Birmingham, which was formally opened on Monday, Sept. 17, is attracting widespread attention; and the attendance last week of representatives of gas undertakings from all parts of the country was extremely good. Those immediately responsible for the promotion of the exhibition are much cheered and gratified by the response which has been forthcoming from both the industry itself and the general public. There is a consensus of opinion that the display is in every way worthy of the great industry.

Apart from the exhibition itself, each day has had a feature of its own. A popular lecture, in the evening, has attracted much attention. The menace to health of the smoke nuisance and the romantic aspects of artificial lighting were each discussed; while at a lecture on Monday one was able to visualize the many and varied products that are derived from coal carbonization.

On Wednesday the Right Hon. J. R. Clynes, M.P. (who, on Tuesday, Oct. 2, will speak at the general meeting of the British Commercial Gas Association), Mr. Hayday, M.P., and Mr. Will Thorne, M.P., visited the exhibition. They were accompanied by Mr. Eldred Hallas and Alderman Simpson, of Birmingham (officials of the General Workers' Union). Mr. Will Thorne is a native of Birmingham, and was at one time a labourer at the gas-works at Saltley. The members of the Manchester Corporation Gas Committee, accompanied by their Chairman (Alderman Sir William Kay) also paid a visit to the exhibition. All expressed themselves highly interested, and commented upon the very comprehensive character of the display. It was described, in fact, as a happy blending of things technical and popular.

On Thursday the Mayor of Stockport (Sir Thomas Robotham) and the members of the Gas Committee, with their Engineer (Mr. S. Meunier), paid a visit. Friday was a busy day; visitors arriving from all parts of the country—from Glasgow in the north to Southampton on the south coast—while on Saturday there were scenes of great animation. The junior members of the industry connected with the various Associations and members of the Salesmen's Circles attended in force. So large was the number from London that a special train was run by the Gas Light and Coke Company; and there was also a very numerous contingent from Lancashire. A feature of the proceedings on Saturday was a joint meeting of the Junior Gas Associations and the Gas Salesmen's Circles, which is fully reported in "THE GAS SALESMAN" this week. A most inspiring address was delivered by Mr. F. W. Goodenough (the Executive Chairman of the British Commercial Gas Association), who presided; while Mr. Walter Hole gave an outline of "The Scheme for Technical Education in the Gas Industry."

On Monday the members of the Birmingham Gas Committee, and of the Leicester and Oldbury Committees, made official visits to the exhibition.

The daily cookery lectures and demonstrations make a popular appeal, and there are, of course, large audiences at all the concerts by the band of the Welsh Guards.

This week started well at Bingley Hall. The Royal Marine Artillery Band opened their series of concerts before a large audience. The daily cooking demonstrations are making a very popular appeal, and arrangements have been completed by which parties of school girls may witness them. The visitors included the Birmingham Gas Committee and the Committees of the Leicester and Oldbury Corporations. Huddersfield and Glasgow Gas-Works were also represented. M. Mougin, the accredited representative of the Société Technique de l'Industrie du Gaz en France, was present, as well as distinguished gas engineers from Paris. Mr. K. Saito, mechanical engineer, Gas Department, South Manchurian Railway Company, was greatly interested in the latest developments in gas engineering practice.

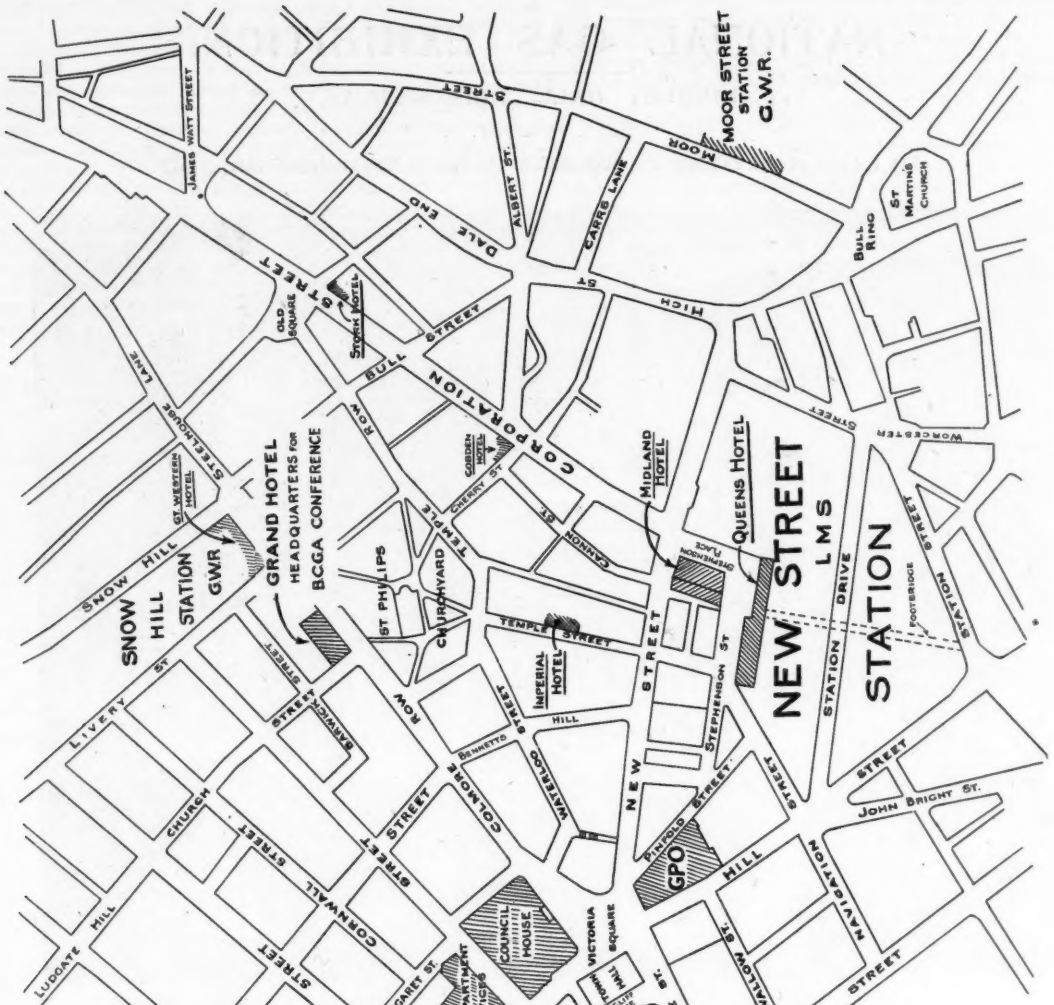
We understand that yesterday's visitors included Mr. H. C. Honey (Director of Gas Administration of the Board of Trade) and Mr. Percy Ashley (Assistant Secretary of the Industries and Manufactures Department of the Board).

SMOKE AND ILL-HEALTH.

By Dr. R. H. JOLLY, Medical Officer of Health for Wolverhampton.

On Monday, Sept. 17, Dr. R. H. Jolly delivered a lecture on "Smoke as a Cause of Ill-Health." Alderman Sir William Kay (Chairman of the Manchester Corporation Gas Committee) was announced to preside; but owing to the death of his son, as the result of a motoring accident, Councillor Houlston (the Chairman of the Birmingham Public Health Committee) occupied the chair. "Smoke is one of the greatest difficulties we have to contend with in Birmingham," said the Councillor; "and it is almost entirely due to the use of raw coal." The gas industry had done much to combat the evil.

Dr. Jolly observed that it was common knowledge that people who lived and worked in the country had a better chance of living to a ripe old age. The Registrar-General had shown by



HOW TO REACH THE NATIONAL GAS EXHIBITION AND THE "B.C.G.A." CONFERENCE HALL (PARADISE STREET).

statistics that young adult females in the agricultural parts of Surrey could hope to live nine years longer than their sisters who dwelt in an industrial town like Oldham; and it was always found that the death rates in the country districts were lower than those recorded for our urban populations. This was to some extent due to the wasteful and unscientific methods of burning raw coal. Every day the unfortunate town dweller breathed into his lungs some 40-lbs. weight of air laden with soot, tar, and acids. Then, again, there was the indirect injury to health produced by the depressing effect of a smoke-laden atmosphere. The annual factory consumption of coal in the United Kingdom was about 100 million tons, and the domestic consumption about 40 million tons. But it would be wrong to infer that the factory chimney was chiefly to blame for the smoke nuisance. Owing to the higher temperature of a furnace, far less coal was wasted by it than by a domestic fire. Roughly speaking, a furnace chimney gave off about 14 lbs. of soot, tar, &c., for every ton of coal burned; while a domestic chimney wasted eight times this amount in every ton. In the United Kingdom alone, nearly 2½ million tons of coal escaped each year from chimney-tops in the form of soot—a quantity sufficient to supply heat to half London for one year. In using gas, one did not pollute the atmosphere; while in the manufacture of gas valuable bye-products were derived.

DISTRIBUTION OF "FAIRY" COMPETITION PRIZES.

On Tuesday evening there was a large attendance of parents and children; the occasion being the presentation by Alderman J. H. Lloyd (the Chairman of the Birmingham Gas Committee) of the prizes won by Birmingham children in the British Commercial Gas Association Fairy Gas Competition, 1922-23. It was

REPRESENTATIVES OF THE GASWORKERS OF THE COUNTRY.

Left to Right—

Mr. THOS. HURLEY	District Secretary, N.U.G.W.
Alderman H. SIMPSON	Secretary of the Regional Council for the Gas Industry.
Rt. Hon. J. R. CLYNES, P.C., M.P...	President, N.U.G.W.
Mr. ARTHUR HAYDAY, M.P., J.P.	West District Vice-President, N.U.G.W.
Mr. ELDRED HALLAS	Midland District President, N.U.G.W.
Mr. WILL THORNE, M.P., J.P.	General Secretary, N.U.G.W.

stated that the competition was organized annually by the Association. There was a record number of 300,000 entries this year, and 30,000 were deemed worthy to be forwarded to London for final judgment. The competition was not only of interest in view of the prizes offered—this year £117 in money, and over 400 books—but it was also of educational value. It attracted not only the children who competed, but their parents and school teachers, and in some cases the Local Education Committees. The tasks set ranged from the writing of an essay, for children over thirteen years of age, to the pricking-out in coloured cottons of a gas fire drawn on a card, for children under seven years of age; while children between those ages were engaged on two different tasks in water-colour painting. A responsible Committee of Educationists arranged the competition and judged the efforts.

The CHAIRMAN, in opening, said some of them might wonder why they had been so long in distributing the local prizes. The only reason was that, when the results were announced in the Press, in June last, they had begun the arrangements for the holding of this great National Gas Exhibition; and it was thought that it would be a good plan to hold over the prize distribution until the exhibition was open, and then to extend an invitation to the successful children, their parents, and teachers to come and see what gas was actually doing. Last year's competition was very successful; but the 1922-23 one was even more so. In Birmingham alone they distributed 20,000 entry forms; and they had every reason to believe that a very large proportion of those were forwarded to London. Birmingham had not secured so many of the national prizes as last year; but this was hardly to be wondered at, when one thought of the vast increase in the number of entries submitted. Birmingham children won eight third prizes in the national competition, and twelve consolation prizes. In addition to this, the Birmingham Gas Committee decided to award local prizes for the best efforts sent in by local children. For each class the Gas Committee offered a first prize of £2 in cash, a second prize of £1 in cash, and six consolation prizes of the value of 5s. each.

BABIES AND THE SMOKE CURSE.

By NORA MARCH, B.Sc.

Miss Nora March, B.Sc., Secretary of the National Baby Week Council and Editor of "National Health," delivered a lecture on Wednesday on "Babies and the Smoke Curse." The chair was occupied by Mrs. T. Sidney Walker, J.P., who pointed out that the absence of smoke would be a great thing for the health of the community. Smoke hung over industrial cities like a cloud; but difficult as the task to combat this evil was, much could be done. Chicago, once one of the blackest cities in the world, was now a clean one; and the atmosphere of New York had also much improved. In this country some headway was being made. Thirty years ago the infant mortality rate was twice as high as it was to-day.

Miss March said she wanted to take two towns of similar size, and contrast what happened in them In 1922 there were 1750 babies born at Rotherham and 1704 in Northampton. Rotherham had a population of 69,000, and Northampton of 93,000. Yet 149 babies died in Rotherham, and only 87 in Northampton. She was once lecturing in Northampton; and she asked the Medical Officer of Health why the atmosphere was so clear. His reply was that most of their factories used smokeless fuel. This was obviously the reason of the low death rate of babies in Northampton. The Rotherham figures were very significant. Factory smoke did a lot of harm, but household smoke did even more. The mother could cook and wash and do her work generally without producing smoke; and it was her duty to do this. "I have a gas-fire in every room," said Miss March. "The amount of work they save is wonderful. I wish that every woman could have a gas-fire, and do all her cooking and all her laundry work without having to use coal at all."

Mr. R. J. ROGERS, proposing a vote of thanks to Miss March and Mrs. Sidney Walker, said some of them might think: "It is all very well for you to say do away with your coal-fires and try gas cookers, but we cannot afford to use gas for cooking and heating purposes." If, however, they looked round the exhibition, they would find what great improvements had been made in the means of heating and cooking. The gas-fires and cookers were very much more economical than the apparatus supplied in the past. Moreover, there was in the near future to be a reduction of 6d. per 1000 c.ft. of gas, which would help them greatly.

THE ROMANCE OF ARTIFICIAL LIGHTING.

By W. J. LIBERTY, Lighting Inspector, Corporation of London.

A lengthy illustrated lecture on "The Romance of Artificial Lighting" was delivered last Friday by Mr. W. J. Liberty, who dealt with his subject in his customary thorough manner. Mr. F. W. Goodenough, who presided, observed that Mr. Liberty had an almost unique experience in connection with artificial lighting. He had been for over 44 years in the Lighting Dept. of the City of London. During that time the development of artificial lighting had been almost greater than during the whole of the previous period.

Mr. Liberty then proceeded with his lecture, in which, beginning with the very earliest times, he described the lighting media of our ancestors in a highly interesting manner. Of the Metropolis, he

THE "B.C.G.A." SMOKE-ABATEMENT AND BYE-PRODUCTS APPEAL—EXHIBIT No. 46.

has naturally made a special study; and he had therefore much to say with regard to the early street lighting of London. In 1668 (there had been orders regarding the hanging-out of lamps before this), following the Great Fire, regulations were made for improving the streets under the direction of Sir Christopher Wren; and Londoners were then reminded about duly hanging-out their lamps at the accustomed time. In 1716, the Court of Common Council ordained that housekeepers whose premises fronted any street, lane, or public passage should, on every night according to the moon, hang out one or more lights from 6 to 10 p.m., under a penalty of 1s. These regulations, however, seem to have been ineffectual; and some twenty years later, upon application to Parliament for power to light their streets, an Act was passed giving the Corporation power to erect such gas-lamps as they thought proper, and to keep them alight from sunset to sunrise throughout the year. The total number of these lamps reached 4679 in 1739. The increasing prevalence of robberies rendered it necessary, in 1744, to apply for another Act of Parliament to regulate and further light the City. And so matters went on, until the great change came.

The introduction of gas lighting more than a hundred years ago was destined not only to alter domestic habits, but to increase the output of work, and consequently the wage-earning capacity of the people. The lengthening of the day naturally brought with it greater facilities for reading, which led to a desire for more liberal education. New industries came into being, and stimulus was given to scientific research. But the promise of these benefits was not at first recognized. In 1813 Westminster Bridge was lighted by gas-lamps; but so strong was the working-class opposition to the new invention that Clegg, the great Engineer, was at first obliged to light the lamps himself. It was a time of great distress, and rioting against the introduction of machinery; and 40,000 cotton weavers had recently come out on strike. It was resolved by the Court of the then recently-formed Chartered Gas Company that the Secretary "do provide a brace of pistols, a short sword, and a great-coat for the watchman of the works." In 1815 the Guildhall (for the Lord Mayor's banquet) was first lighted by gas. Thereafter the use of gas grew apace. A great step was marked when the method of charging for gas at "per burner" was changed to sale by measurement; but an even greater revolution was brought about by the introduction of the incandescent mantle. "It is," said Mr. Liberty, "nearly forty years since Welsbach first applied the bunsen flame to make heat supply light. At that time a representative hot from the works of Welsbach came to the City of London, and called at the Guildhall, with a request to be allowed to put up what he called a 'stocking,' to illustrate the invention. The 'stocking' was a very fragile affair. On the day after it was fixed in the office over my desk, I found a little heap of dust on the blotting pad. That was the end of the first Welsbach mantle I knew of in the City of London." Much history has been made since then.

In 1922, in the Metropolis alone, with about 500 miles of streets, there were no less than from 28,000 to 30,000 lamps (gas and electric), under the control of the Corporation of the City of London, the London County Council, and twenty-eight Borough Councils.

AN EXAMPLE OF "B.C.G.A." ASSISTANCE—EXHIBIT No. 20.

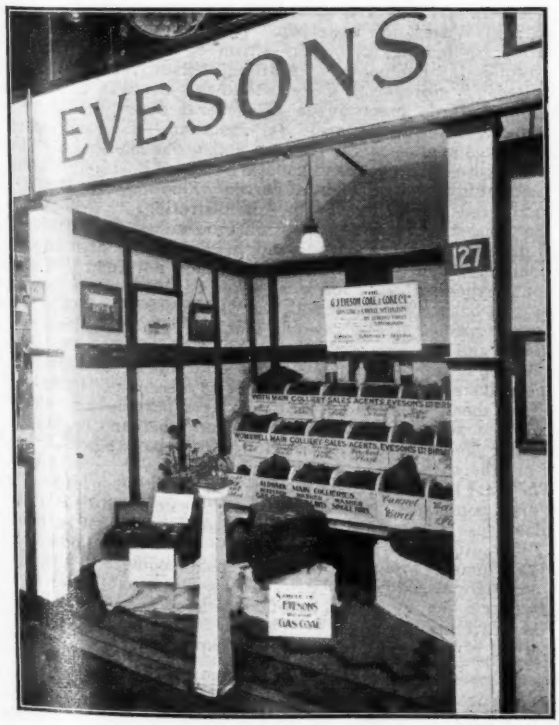
GAS-MANTLES IN THE MAKING, AND OTHER WELSBACH PRODUCTIONS.

"COAL AND WHAT WE GET FROM IT."

By W. A. TWINE, A.M.I.Mech.E., A.I.C.

An interesting lecture on "Coal and What we Get from It," was delivered last Monday evening, by Mr. W. A. Twine, A.M.I.Mech.E., A.I.C., Chemical Plant Superintendent, City of Birmingham Gas Department. Sir Arthur Duckham, K.C.B., presided.

Mr. Twine pointed out that not many years ago coal tar was regarded by the gas engineer as an incubus. He was concerned with the primary production of gas for illumination, heating and power; and tar, a prolific residual, was unwieldy and sticky, and a bothersome nuisance. Science had given to the bye-product of gas-making a value and importance to modern industry, even transcending that of the primary manufacture of the gas undertaking. "Just as we are reminded," observed the lecturer, "that in the burning coal we see the bottled-up sunshine of countless ages ago, so in the inky blackness of the coal tar, science has revealed to us a hidden storehouse of the iridescent hues of the rainbow—the blues of the skies, the green glory of the fields and woodlands, the yellow and crimson of the flowers, their fragrance, and the sweetness of their honey. There seems to be no limit to the transformations which science has produced, and can produce, from coal tar." At one end was the irreducible residual for which science at present had no further use—the dehydrated tar which was largely used for tar-spraying our roads, thus helping to rid us of the dust nuisance. Tar-spraying and the manufacture of tar macadam had revolutionized the road problem created by the vast extension of the motor industry. The other prosaic residual of the tar—pitch—was used for making briquettes from coal dust, and entered into the manufacture of varnishes and blacks, and was used in roadwork. These results, while of importance, were commonplace compared with the marvels which were revealed at the other end of the scale. The heat treatment of tar in stills yielded as primary products light, middle, and heavy oils; from the light oils was obtained benzole, an invaluable home-produced source of supply of power for the motor industry. Next there was solvent naphtha, which was indispensable for the successful carrying-on of the rubber industry. The middle oils—their production depended upon the temperature employed in the process of tar distillation—gave naphthalene, which was of incalculable value to the dye industry. It was almost incredible how science had been able from a block of five standard dyes to build up



A Lesson on Coal.

Tubes of Many Kinds.

successive groups of colours, until the number and variety was bewildering.

Since the war there had been, Mr. Twine pointed out, much concern over the part which Germany had played in the development of the dye industry; and while we could not in every instance equal the Germans in the production of every dye, we could claim to have produced upwards of 200 new dyes since 1914, which were quite as good as the best Germany had ever produced. Every week, thanks to the resourcefulness of our chemists and chemical engineers, new dyes were being produced, and, what was more, at a price comparable with that of our competitors. Carbolic acid was another derivative from the middle oils, and brought before us a varied range of disinfectants, the value of which was demonstrated during, and since, the war. Picric and salicylic acid must be remembered in this connection. There were scents on the market to-day which were the results of coal-tar products, and, therefore, primarily, of the carbonizing of coal for gas manufacture. The chemist had built-up a variety of synthetic scents and perfumes. The photographer's art was under a debt of obligation to the chemist, who had produced from coal tar photographic materials and developers. Again, the basis of enamels was obtained from coal; and so, too, was creosote oil, which, besides being a fine wood preservative, was largely used as an oil fuel in the navy. In the manufacture of high explosives it had also played its part. "T.N.T." was derived from gas-works and coke-oven works, by taking creosote oil and washing the gas with it. Tri-nitro-toluol was the high explosive used in shells, in hand grenades, rifle grenades, air bombs, and trench mortars. In Birmingham alone they had recovered 850,000 gallons of crude benzole.

Next to tar, the biggest bugbear to the gas manufacturer was, Mr. Twine added, ammonia, in the crude product of coal carbonizing. Here, again, as with coal tar, the chemist had come to the rescue. Until recent years, it was the custom to regard artificial manures as comparatively novel. Their use was in an experimental stage in relation to agriculture; but science had demonstrated that the valuable manurial constituents of ordinary manures, guano, and the like, were ammonia salts or nitrogen, phosphates, and potash. Sulphate of ammonia proved advantageous for nearly every crop on most soils; and it was one of the best forms in which nitrogen might be applied to food-producing soil. It was the cheapest and most easily obtained nitrogenous fertilizer; and the gas engineer was producing a wealth of supplies of ammonium sulphate. In the distillation of ammonia he was turning out stores of the ammonium sulphide used in our salt works. Ammonium hydrate was largely employed in salt and soda works, and for refrigerating plant. Wool and cotton washing was carried on by means of ammonia; and ammonium chloride was employed in the galvanizing industry and in cotton printing. Ammonium carbonate brought us to the food problem; for it was used to a great extent in biscuit manufacture and in baking powders. Ammonium nitrate was utilized in the production of high explosives. Still the list was incomplete. Oil of vitriol was made from the sulphur extracted as an impurity from the gas; and large quantities of the acid were made use of in the manufacture of sulphate of ammonia. The carbon taken periodically from gas-works retorts was another valuable commodity, which had application in the electricity industry. "In Birmingham on a winter's day," the lecturer concluded, "we carbonize over 3000 tons of coal; and 30,000 gallons of crude petroleum oil are used in the manufacture of water gas. We make about 11,000 million c.ft. of gas per annum. We have upwards of 190,000 consumers. The Corporation own over 1500 coal and coke wagons; but more than double this number are required to deal with our coal and coke traffic."

Added interest was given to the lecture by a working model in glass of a gas-works, including vertical retort, air condensers, water condensers, cyanide extracting plant, ammonia scrubbers, purifiers, oil-washing plant (benzole and naphthalene), station meter, governor, and gasholder. The manufacture of prussian blues and sulphate of ammonia was also demonstrated; and naphthalene and dye experiments were made.

THE "PLENO" STAND (No. 6).

Owing to the fact that Pleno, Ltd., were not allotted this position until two days before the exhibition was opened, we were not able to include a description of their stand in our "View of the Exhibits" last week. "Perfect flames rationally applied" is an inscription that adorns the stand. It summarizes a very interesting series of exhibits, the official list of which is as follows: (1) The type of hot-plate in use fifty years ago, and up to 1920. (2) The type of "Pleno" burner of 1916. (3) The "Pleno" hot-plate of 1923. (4) Examples of the "Pleno" ovens of 1923, in combination with hot-plate and rack. (This display embodies a special patent griller, which toasts or grills above and below at the same time; a light steel bar hot-plate with a clear space round the burners; an oven with closed-in bottom; a single oven burner; and other features. The combination has two ovens; the lower one carrying the upper, and being used for warming plates and dishes, as well as for cooking. Continuous, unbroken flames are a feature of all the burners.) (5) Small oven and hot-plate with draw-out crown plate forming a useful table. (6) Solid smooth-top hot-plate with "Pleno" burners. (7) Double griller suitable for small hotels and boarding houses—with adjustable table. (8) Ordinary boiling-ring burner introduced about fifty years ago, generally supplied up to the year 1920, and still supplied. (9) "Pleno" boiling-ring burner supplied in 1918, and designed in 1916. (10) Hot-plate boiling-ring burner as adopted by the National Gas Council of Great Britain and Ireland for use on the "Standard" cooker in 1923; compared with (11) "Pleno" hot-plate boiling-ring burner with adjustable orifice, giving perfect flame structure and complete flame contact. (12) Flat rings for testing flames. (13) "Pleno" hot-plate burner with movable kettle rests combined with adjustable device. (14) "Pleno" iron-fret griller burner. (15) Flame-dividing arrangement for testing flames. (16) Original "Pleno" oven burners. (17) Small adjustable griller table. (18) Patent swivel attachment for hot-plate to cooker, allowing the firm's patent hot-plate to be attached to any existing gas-oven in five minutes. (19) "Pleno" skeleton open-bar hot-plate for use with any burner, to fit any oven.

All the burners and appliances are covered by patents already granted or applied for; and the designs are registered, or application made for registration.

Erratum—Exhibit No 82.

In our notice of the stand of the New Inverted Incandescent Gas Lamp Co., Ltd., on p. 837 of last week's issue, an unfortunate mistake occurred in arranging the blocks from which the illustrations were printed. The wall-bracket reproduced on that page was shown obviously upside down. The error is regretted.

THE EASTERN COUNTIES ASSOCIATION PAPERS.

Some Comments by a Visitor.

We have received from a visitor to the meeting the following comments upon the papers read before the Eastern Counties Gas Managers' Association in London on Sept. 12, and reproduced in last week's issue of the "JOURNAL."

COSTS.

Mr. H. C. Smith's paper upon "Works Costs" will be read and appreciated by a much larger audience than that actually taking part in the discussion. It is a highly practical paper; and though the subject is one very difficult of exposition, the author deserves sincere congratulations upon the method of presentation. As was stated during the discussion, the apparent complexity disappears in actual working of such a system as he described. Mr. Townsend was quite right in emphasizing that figures as examples must be considered only in relation to the context in Mr. Smith's paper. It must not be argued that such-and-such figures give incidental information as to the merits of diverse types of plant and are capable of a general application. Nevertheless, the cost charts shown in fig. 13 of the paper are wonderfully interesting, and give rise to a number of pertinent queries having reference to the claims hitherto advanced by the advocates of various types of gas-retorts.

For those managers who wish to introduce a cost system suitable for their own particular circumstances, a few words of advice may be given to supplement the paper under notice. There are three main manufacturing costs for each department: (1) Labour: Wages and insurance. (2) Repairs and maintenance: (*a*) Wages, (*b*) materials. (3) Services: (*a*) Water, (*b*) heating, (*c*) lighting, (*d*) power—steam or gas, (*e*) electricity, (*f*) hydraulic, (*g*) pneumatic, (*h*) lifting, hoisting, &c., (*i*) special services, (*j*) stores—oil, waste, workmen's overalls, &c. Again, there are three main heads of general departmental costs: (4) Rent, rates, and taxes. (5) Insurance—fire and special. (6) Management—general foremen and works managers. There are also three main heads of general overhead costs: (7) Interest on capital invested on plant at current valuation. (8) Depreciation and redemption fund. (9) Administration.

To these manufacturing costs must be added the cost of the raw material of manufacture; and, in the opinion of many cost accountants, this cost should be computed not upon the actual amount expended, but upon what would be the mean or average cost on a basis comparable with the "statutory" income so loved by our respected inland revenue officials. On such lines every engineer and manager could think out a system such as would be applicable to the requirements of his undertaking, and probably could make a start in a simple manner on a series of "loose leaf" foolscap sheets until, by actual trial over a period, he is able to decide the actual ruling he requires, and whether this, that, or the other should preferably be entered in separate books, loose leaf or otherwise.

The great thing is to make a start; and the first step is to realize the main components upon which a cost system can be built-up. Hence these comments. Two things should be kept in mind: (1) Differentiate between manufacturing costs, capital costs, and variable market values—otherwise cost keeping will lose half its commercial value. (2) Always pay attention to the mean costs over a lengthy period, and do not allow the costs referring to one certain period to exercise an undue influence if any abnormal variation can be reasonably explained.

GAS-MADE ELECTRICITY.

The advocacy by Mr. J. R. Bradshaw of town gas-driven electricity stations as a desirable adjunct to existing gas and water

undertakings did not meet with an altogether enthusiastic response. It was pointed out that gas and water distribution go well together, but electricity is best kept apart. Mr. Broadberry's experience as detailed by him was interesting; but since then the Electricity Commissioners have been appointed. These gentlemen, of considerable technical ability in the practical details of electricity generation and distribution, have their policy well thought out, and will be found to be equipped with knowledge and power which will be directed to certain well-defined goals.

At present the policy of the Electricity Commissioners appears to be to discourage the expenditure of capital in extending existing, or establishing new, electricity works. Rightly or wrongly, they appear to consider that it is in the national interest to spend money for electrical development mainly upon transmission lines, and not upon generating stations. They have declared the policy of the Government Department to which they are responsible to be the conservation of capital; and in this respect they look askance upon all proposals which involve the purchase of machinery, the cost of which must be liquidated in the course of time. But they favour the expenditure of money for the purchase of cable which suffers no mechanical wear and tear, and practically is of permanent value. This means that every effort of the Commissioners will probably be directed to the linking-up of new districts with existing bulk stations; and where no electrical undertaking at present operates, permission will only be given upon certain conditions as to voltage, frequency, &c.

Apart from these initial difficulties, however, there are others not unconnected with the cost of generation when a high calorific value and highly purified gas is used in internal combustion engines. There are certain conditions which influence generating costs, and not the least is the question of load factor in relation to maximum demand. It would be out of place to go deeply into such matters here; but one word of warning must be given to those who are considering following Mr. Bradshaw's lead. If you generate, be careful how you plan your first station. Remember that the whole success depends upon having the right units, and that the gas engineer who tries to tackle the many problems incidental to the generation of public electricity supply without taking advantage of the experience of gas-electric specialists, is helping himself to what may well be found to be a peck of trouble. Gas-driven electricity works are not necessarily unsuccessful. Indeed, two of the most efficient in the United Kingdom are gas-power stations; but, alas, these are not using "town" gas. The Aldershot Gas, Water, and District Lighting Company and the Buxton Corporation have town-gas stations. Mr. R. W. Edwards, the Chairman of the Aldershot Company, is an enthusiastic pioneer, with the experience of a number of years behind him.

WELFARE AT THE ALBION IRONWORKS.

Opening of the New Canteen.

Last Friday Messrs. West's Gas Improvement Company inaugurated a new canteen at the Albion Ironworks, Miles Platting, Manchester. The occasion was marked by a visit to the shops and a luncheon in the new building, both of which functions were attended and enjoyed by a large and distinguished party. Friday evening and last Monday evening were given to the men and their wives; and we can pledge our word that they enjoyed themselves as much—which was a great deal—as the visitors to their new institution.

The Chairman of the Company (Alderman Fred J. West, J.P.), in his after-luncheon speech, observed that they placed as much importance on the goodwill of their employees as on that of their customers; and goodwill is a most desirable two-party condition, fostered by personality, friendliness, and co-operation. All these qualities in master or man make for efficiency in the factory; efficiency and *esprit de corps* are first cousins. We make this point in order to introduce two quotations from an admirable leader on "Esprit de Corps in the Factory," which by a coincidence appeared in "The Times" on the day following the opening of Messrs. West's canteen. "The welfare movement," says our contemporary, "as directed by its most capable advocates, encourages the team spirit. In affairs that are completely severed from the routine of the works, it fosters healthy co-operation and rivalry, principally in sports and pastimes. The workers play together and oppose the representatives of neighbouring works. The success won is more than the success of the team; the factory shares the honour. The spirit of emulation is aroused; and it can be made to pass from the playing field to the workshop." Again: "There are trade unionists who cynically distort the aims of the welfare movement. They see no reason for the employer to advance the interests of his workpeople unless he has the hope of a direct personal advantage. A longer and more generous view would surely suggest that the fostering of the co-operative spirit in industry, the development of *esprit de corps*, could not be wholly one-sided in its consequences, and that the knitting together of all who share a common enterprise in a genuine companionship would not be detrimental either to the immediate interests of the workman or to the development of that intelligent understanding of the character of his employment which would be a primary qualification for the voice to which he aspires in the control of his working conditions. *Esprit de corps* in the factory would make work at least a little nobler." The foregoing surely expresses clearly the impression left on the minds of those who were fortunate enough to take part in last Friday's proceedings. May the welfare movement spread and bring a little sun to those, among others, who look with the green spectacles of jealousy on the healthy co-operation of employers and employed, and who pass ill-considered motions of censure on their fellows who work contentedly as co-partners!

Welfare receives primary consideration at the Albion Ironworks, difficult though this is in city surroundings. Messrs. West's Gas Improvement Company, in the book which is described later, say: With the development of transport, employees tend to live, in increasing numbers, further from the works; and now a very considerable proportion of them are unable to get home for a mid-day meal. The canteen thus became a necessity. This necessity was met during the war by more or less temporary buildings and accommodation. But the Directors recognized that a liberal provision in this respect was a condition of efficient working; and they erected the new building on ground a little apart from the works. A very careful study was made of the latest methods of equipment and organization of these institutions; and it is believed that the canteen opened last week represents the ideal of common sense—complete, without being in any way extravagant.

The Social Society forms the basis for the social relations between the firm and all sections of the employees. This Society began spontaneously some years ago in the form of a staff organization. With the development, however, of the Works Committee, the employees requested to be included in the Society; and the original members willingly acceded to the proposal. The point is that, though the firm at once gave every reasonable encouragement and indeed generous support to the Social Society, it is essentially a voluntary and self-governing organization.

View of the Sports Field.

The sports field is perhaps the greatest evidence of the support given by the firm to the Society, for when it was seen how football and cricket teams were got together and matches undertaken without any facilities other than those provided by the public parks—and in a crowded city like Manchester these facilities are generally insufficient—the firm decided that it was a wise policy to provide accommodation for sport, and deemed that such facilities would conduce to efficiency in the best sense of the word. Ground was therefore acquired on a site as near as possible to the works; and this has been laid out in a football and cricket pitch—turf having been brought from some 20 miles away. Two shale tennis courts are in course of construction, and a bowling green is nearing completion. A pavilion has been erected, and all members of the Society are satisfied that they have sports facilities which are far in excess of what could have been provided in the city by their own unaided efforts, and equal to those of a good many societies in the country.

Arrived at the works, each visitor received a printed plan of the shops and detail of the route to be followed; and having assembled in a part of the offices where drawings and descriptions of the firm's installations were displayed, they were divided into parties, and set-off on the inspection. A novel feature was introduced by the marking in white lines the path to be taken. A description of the works, taken from the presentation book which had been prepared for the occasion, will be given in next week's "JOURNAL." We have sought for an adequate word to describe with neatness this souvenir book—a thing of beauty in leather and gold—but our mind gets no further than the volumes which we used to see others carrying away from school; and they were known simply as "prizes."

After the inspection, light refreshments were served in the offices; and the company then crossed to the canteen for luncheon. The new building lies on the opposite side of Hulme Hall Lane

Luncheon in the New Canteen.

from the works and offices. It is in red brick, and there are three entrances from the lane. Inside it consists of a main hall, with cloak room and kitchen accommodation down one side and a platform at the south end. It is comfortable, yet utilitarian—eminently suitable to its purpose; above all, it is bright and cheerful. The roof is carried on steel-angle trusses, roof lights extending the whole length on each side. The heating is by steam pipes and radiators; and the floor is in parquet wood blocks. Gas is used for cooking, and was responsible for the excellent luncheon served last Friday. The canteen may be divided into two by panelled doors which fold back on to the walls, leaving the entire floor space clear for any large function. The arrangements, which included orchestral selections, were excellent. Ald. Fred West was in the chair, and to his right and left were Ald. Sir William Kay and Ald. A. Ball (Chairmen of the Manchester and Nottingham Gas Committees respectively). Sir Dugald Clerk (Past-President of the Institution of Gas Engineers) and Sir H. Mensforth (Director-General of H.M. Ordnance Factories) were there; and Ald. Phillips (Chairman of the Salford Gas Committee) and Captain Hilton (Managing Director of Metropolitan Vickers, Ltd.). Mr. Samuel Glover enjoyed the latters' good cheer and that of Ald. Ball; while to the right of Ald. Phillips was Mr. Pooley, of Leicester, who spoke for the gas industry. Dr. H. G. Colman and Mr. T. A. Tomlinson (the Works Chief Engineer) were present; and many well-known gas engineers had the company of the Board and the staff of the firm. Those who know the Board and the officers of West's Gas Improvement Company will be very certain that hospitality was of the first order.

The toast of "The King" was proposed by the CHAIRMAN, and honoured according to custom.

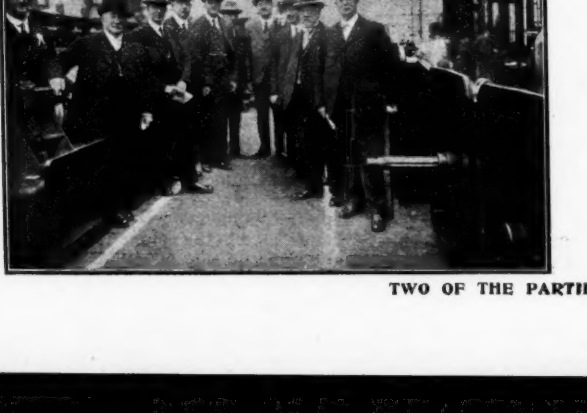
THE GAS INDUSTRY.

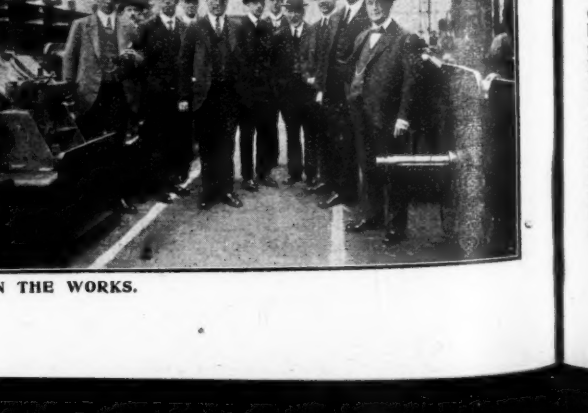
Capt. R. S. HILTON, Managing-Director of the Metropolitan Vickers Electrical Company, Ltd., in proposing "The Gas Industry," said the Chairman had told him in his usual frank way that he wished this toast to be proposed by an outsider. [Laughter.] At first there seemed to be some hidden meaning in this phrase. Then it came home to him that he was an outsider as far as the gas industry was concerned, that the time when he enjoyed the privilege of being one of them had receded into the dim distance some four or five years, and he could no longer consider himself one of the elect. But perhaps the fact of being an outsider enabled one to take an unprejudiced view of what was going on inside; and he had been much interested in the industry, and had greatly honoured it in his thoughts since the time he quitted it. It had been a developing industry for years; and he did not think any firm could claim to have shown more of the pioneer spirit than West's Gas Improvement Company. [Applause.] They were among the first people to tell the world what could be got out of coal. In this connection, he was sure the guests would like him to mention the name of the late Mr. John West, the founder of the firm whose hospitality they were enjoying, and the father of their respected Chairman. There was no greater pioneer in gas matters generally than the late Mr. West; and they all owed him a very great debt of gratitude.

The achievements of gas were varied and numerous. The latest was the cooking of the luncheon they had enjoyed, which he found by discreet inquiries was cooked by gas! He congratulated the cooks on the very excellent results obtained, handicapped as they were by not using electric cookers. [Renewed laughter.] Perhaps that was not a tactful remark, and therefore he might set himself right with the company by telling them that in the canteen of his own firm at Trafford Park the cooking was done by gas. Moreover, in their works they used gas in many ways, for heat treatment, for muffles, in moulding, and so on, and they found it most useful. On the other side, he was equally glad to state that among their customers were a large number of gas undertakings who gave them orders for power houses, motors, and so forth. So to a certain extent gas and electricity were interdependent; and he thought that the dependence of one upon the other was likely to grow. In this country, at the present time, industry had to solve the problem of how to procure cheap power. This was one of the greatest needs of manufacturers. The problem would be solved by gas and electricity—by each of them to a certain extent, but by both of them in conjunction to a much greater extent. The friendly rivalry between gas and electricity would continue in the future; and it was well for both that there should be such competition. Yet, as time went on, they would come together, possibly through people who, like himself, had been through the mill under both régimes. The spirit which permeated the whole gas industry had impressed itself upon his mind. They knew the work which had been done by the Institution of Gas Engineers, by the Junior Associations, and by the British Commercial Gas Association, which was a very wonderful and very successful organization, and could be commended in all sincerity to one's electrical friends. Efforts had been made to improve not only the actual manufacture of gas, but also its disposal—to render service to the customer. In that respect many other industries could take a leaf out of the gas industry's book and benefit by it.

In his own days—it was not so very long ago—they talked about 12,000 c.ft. to 13,000 c.ft. of gas to the ton, and thought this looked very well. He was told that now 15,000 to 16,000 c.ft. per ton was quite a usual thing, and that sometimes it rose to as much as 18,000 and 20,000 c.ft. Surely this was progress, and progress at an enormous rate within a very short period. So the gas industry was not dead. It was flourishing, and would surely live. The last occasion when he met several of his hearers was during the war in connection with the extraction of toluole and nitro-benzole from coal gas. The spirit of team work was uppermost at that time; and the gas industry (as he knew from personal association with it) responded gladly and nobly to every call that was made upon it by the High Explosives Department, with the result that the Ministry of Munitions were never short of high explosives to fill their shells. Those were achievements in which the gas industry took a very large part. He hoped in the future people would talk more of power and less of gas and electricity considered separately. He coupled with the toast the names of two old friends of his—Alderman Ball and Mr. Pooley.

Alderman A. BALL (the Chairman of the Nottingham Gas Committee) said that all he knew about the gas industry was information gleaned through rubbing shoulders with men who knew all about it. Judging from what he had seen that morning, he should imagine that the manufacture of machinery was more profitable than the making of the gas. In 1802 the first exhibition of gas illumination was given in Birmingham to celebrate the Peace of Amiens. In 1805 the first gas-lighting installation was put up by William Murdoch at the works of Messrs. Phillips and Leigh, in Manchester. He supposed that Phillips must have been a forebear of their friend Alderman Phillips, who took such a keen interest in everything connected with the gas industry. [Applause.] In 1820 a firm named Appleby, Clay, and Fisher began to supply gas to Salford; and the ratepayers of the town purchased that undertaking in 1832 for £6000. Did it not seem almost incredible that the gas undertaking of Salford should have been sold for so small an amount? From the very early days, the profits derived from gas were applied to useful purposes. One instance was that in 1831 £6907 was so given to the Improvement Committee of the Manchester Corporation. An industry that could make such headway was not going to be wiped-out easily by the adoption of electricity or any other source of power. Still, it was up to the young men to see to it that England held her own. They all of them regarded the Chairman and his late father with the greatest respect. They realized that the late Mr. John West was one of the men who helped to make England what she is, and what she will long remain. [Loud applause.] In Nottingham, an example of his excellent work was to be seen in the shape of stoking machinery that had been at work thirty years. He





TWO OF THE PARTIES ON THE WORKS.

ventured to say that for the purposes for which it was designed there was no more useful machinery in the country to-day. When he looked at the new-fangled ideas, with all their troubles, trials, and tribulations, he was almost forced to the conclusion that the machines which the late John West put in were still the simplest and easiest to work, and gave the least cause of anxiety to the engineer who was in charge. He must, however, say a word or two in praise of the Glover-West vertical retorts. Some years ago an installation was put in at Nottingham, and experience showed that there were no better vertical retorts being made to-day than the Glover-West. They were getting as good (if not better) results from that installation as anybody in the country. Their only regret was that they did not duplicate the installation at a time when they could have got it at a reasonable price. [Laughter.] When they did put in additional verticals, they would be of the same type. He agreed with Captain Hilton that gas undertakings and electrical undertakings would have to work together. The country could not go on raising steam by direct burning of coal, because the residuals obtained from it were needed. This fact was conclusively demonstrated during the great war. Therefore he thought the time would come when the two great sources of power would be gas and electricity. With these working hand in hand, the country would get the very best results; but both masters and men must be ready to rise to the occasion—to realize the importance of not taking things too easily, but earnestly aiming at the production of more and cheaper material.

Mr. HUBERT POOLEY (the General Manager of the Leicester Corporation Gas-Works) said he did not think of Captain Hilton as an outsider to the gas industry. In the Midlands, they were very proud of the work he did in Birmingham. It was a great pleasure to him to be associated with Alderman Ball in connection with this toast; and he regarded it as a very high honour to have been asked to respond to it. Considerably over thirty years had passed since he came into the gas world; and in serving the industry in his own way he had derived much pleasure, which was in no way lessened by his present duty. The magnitude of the industry would be better understood when he stated that there were engaged in it some 70,000 persons earning annually quite £7,000,000. In England and Wales there were about 7,000,000 customers, of whom nearly 4,000,000 obtained their gas through prepayment meters; and the capital sunk in gas undertakings was about £120,000,000. So in representing this great industry at this important gathering, he was conscious of the responsibility of his position. They were paying a tribute to the memory of the stalwarts who in their day served most faithfully and well. Among a host of others, he recalled the names of Murdoch, Clegg, William Young, King, Livesey, Woodall, and, last but by no means least, their old friend John West, who left them when full of years and honour, beloved by all who knew him. It was due in no small measure to the successful efforts of these men that the gas industry was to-day one of the greatest national assets. Behind it was over a century of unbroken progress: and it still held the premier position as a source of light, heat, and power. There was a time in his own history when his great ambition was to sell 10,000 c.ft. of 24-candle gas to the ton of coal. A few years later he arrived at 11,800 c.ft. of 16-candle gas. In the one case he used Fifeshire coal, and in the other Staffordshire coal. To-day he was aiming at a make of 19,000 c.ft. per ton, of a gross value of 460 B.Th.U. per cubic foot, or over 87 therms per ton. That was with Derbyshire coal. Incidentally, he might say that he expected to get this result from plant recently installed by their hosts; but it was too early to give the actual working results. The plant was working, but was not yet fully tuned-up. However, this was the fourth installation which Messrs. West had put in for the City of Leicester; and on previous occasions all the guarantees had been amply fulfilled. Only very rarely had they got less than 10 p.ct. above the guarantee given. The first installation was put in ten years ago, and was brought into work on Jan. 1, 1914; and they considered they were very fortunate in having had this plant in successful operation through the war period. During the inspection of Messrs. West's works that day, they had seen evidence of ample provision for the comfort of the employees. In the days to come the great mass of workers would be engaged in skilled trades, and their outlook would be infinitely better than that of the manual worker in the old days of hand-stoking. The introduction of vertical retorts in their own gas-making works in Leicester had vastly improved the conditions of the workers. The ground space occupied was about one-sixth of that required for horizontal retorts of similar capacity, and about one-half of that needed for previous large installations of vertical retorts. The material used—from coal in to coke screened and graded, and put in cart or truck—was handled entirely mechanically; and power was derived from the waste heat of the settings. Even with the individual labourer enjoying over 80 p.ct. more wages than pre-war, the total labour cost was the same as that which obtained pre-war on the then existing vertical system of carbonization. So the dreams of the late William Young, of Friarsford, in the eighties, would be more than realized through the energies of Mr. Samuel Glover, of Mr. John West and his sons, and of their able assistants. To these gentlemen, and to their friendly trade opponents, the gas industry owed a great deal. For some years the industry worked for the country behind a dark bank of clouds. A year or two ago, the silver lining began to show, and now enthusiasts could see the sun once more breaking through to introduce a period of unparalleled success and prosperity.

Sir DUGALD CLERK (invited by the Chairman, as a very old friend, of his, to speak) said he was not a gas engineer in the sense of being concerned with the manufacture of gas; but he had the honour to be a Past-President of the Society of British Gas Industries, and he saw before him many of the friends he had made in that capacity. He had also the honour to be Past-President of the Institution of Gas Engineers; and many of his friends in that body were present. He rejoiced to see the two parts of their great industry coming together in this pleasant manner, to give honour to a very distinguished firm. Mr. John West, and the Company also, had done a great deal by their industry and invention. For many years he corresponded with Mr. John West on gas problems; and the Chairman was a very old friend of his. Therefore he had very great pleasure in supporting the previous speakers.

THE NEW CANTEEN.

Sir H. MENSFORTH (Director-General of H.M. Ordnance Factories) proposed "Success to the New Canteen." He said he was very much impressed with the amount of money that had been spent in the equipment of the building. He could not count himself as one of the old friends of Mr. John West, though he had met him, and recognized his personal qualities as a clever man able to express himself and put forward very good ideas. One could well believe that John West was a pioneer in the gas industry. He did not know that Mr. West's son, the Chairman on this occasion, would acquire the same reputation of being a pioneer in the industry; but he would certainly be regarded as a pioneer in what was really a greater thing—the establishment of proper relationship and feeling between the workpeople and their employers. [Applause.] In the Manchester area there was not a man who had done more work in the promotion of that object than Mr. Fred West. They had met on many occasions in connection with labour matters—negotiations and disputes—and he had always observed in Mr. West a spirit of broad-mindedness, the capacity to see a thing from every angle, to put himself into the position of the other fellow, and generally to bring about that good feeling without which nothing would be accomplished, whatever the young men might do on the technical side. The existence of a feeling of suspicion prevented proper co-operation between the workpeople and their employers, and must be removed. What progress had been made during the last twenty years! Industry gained by the standardization of product; but this gain would be lost by attempting to standardize the workmen. They must be brought to take an interest in what they did. Let a man know that however small a part he played individually, it was something that counted. The only way to do this was by bringing the workpeople in to take counsel with the employers. Some might say that the men knew nothing about the matters which were to be considered; but he doubted whether there was justification for such a statement. When a man who had no educational opportunities looked at the condition of things in Europe to-day, he might well say to himself: "If that is all the educated classes can do for us, we will have a go at it ourselves." It would be a mistake to leave them outside. The old class of skilled tradesman was a valuable element in industry; but to-day this country was moving towards a condition of things when there would be no inducement to learn a skilled trade. The men who had already acquired that skill were being taken away by the United States as fast as they could be got hold of, because in the United States industry had already passed through the stage when it was thought possible to get along without skilled workmen. In order to realize the wish expressed by Ald. Ball for greater and cheaper production, they needed better brains and men with more skill. They were not getting them to-day. When a man who carried to the bricklayer a hod with bricks in it was paid more money than the skilled tool-worker, something was wrong, whatever the reason might be; and industry could not prosper as long as this condition of things prevailed. In the past, engineering shops in this country had been run on the principle of promoting to the position of foremen skilled artisans—men who had been good fitters or good turners. That time had gone, and rightly so. But what had been substituted? They were taking in college graduates, and so on, and putting these men into the works. Were they doing this in the right way? Was not what they needed a blend of the knowledge of craft which the old type of artisan possessed, with the education which was gained in other ways? Instead of this, they were attempting to run factories with highly educated men who did not talk shop language, and who could not always tell the difference between a good job and one that was not done well. The result was to depreciate the value of the work done in the shop as a whole. The men, no doubt, worked to get their bread and butter; but with many of them the recognition of a good job had more weight than money. If the employer's representative, when going round the factory, could not see when a job was done well, and give the man a pat on the back, he must not grumble if the workman did not keep up to that level. So, in proposing success to the new canteen, he did so with the hope that it would do something towards the solution of the problem which confronted them at the present time—how to bring back pride of craft and individuality in work, and how to allay the suspicions generated between the employing classes and those whom they employed.

The CHAIRMAN, responding to the toast, mentioned that the Lord Mayor of Manchester (Councillor Cundiff) had arranged to be present, but was kept away by important municipal business. The President of the Institution of Gas Engineers (Mr. Samuel Tagg) and the Chief Engineer of the Gas Light and Coke Company (Mr. Thomas Hardie) would also have been present if board meetings had not intervened. On behalf of his colleagues, the Directors of the Company, he could only say they were very gratified at the response given to the invitations by many of the leading gas engineers in the country, and by many of his old friends among the engineering employers of the Manchester district. There could be no better augury for the success of the new canteen than the presence at this function of those who, during the last forty years had been helpful and sympathetic to the firm in the conduct of their business. Sir Henry Mensforth was quite right in attaching great value to the maintenance of good feeling between the management and the workpeople. He did not know that the firm regarded that as of less value than the goodwill of their customers. They certainly knew they had the latter; and the latest proof of it was given by the present gathering. As to the relations with their workpeople, they had established a Works Committee on which the management and the employees came together to discuss the difficult and complicated questions which necessarily arose from time to time in a big industrial concern. The men had declared that they appreciated the value of that organization. It was also evidence of the good relationship which had been established, that all had done their utmost—some in large measure, some in a smaller way—to make this function a great success. Later in the day 300 to 400 of the employees would assemble in that room, and on the following Monday there would be a similar gathering; so that everyone might take part in the launching of the new venture. If it helped to maintain the good feeling which existed, it would be a very valuable asset, and contribute materially to the future success of the Company. The Directors were

also much pleased to have this opportunity of showing the progress which had been made since 1884, when his father started the Albion Ironworks, with a staff of workpeople numbering about forty. In these days, when there was talk of nationalization or municipalization of industry, they were justified in looking back over that period, and feeling no inconsiderable pride that the Company had given an example of what could be achieved by individual effort and private enterprise. [Applause.] They were also glad to have the opportunity of showing to their friends the experimental gas-works which was the latest development. They hoped to put it into operation in the course of the next month or two; and they would then be able to carry out tests of coal as they were frequently asked to do, to contribute to research work in the industry, and to apply experimentally the new ideas which were brought forward from time to time in connection with their vertical retort installations and carbonization processes generally.

WATER-GAS PLANTS FOR SMALL GAS-WORKS.

New Plant at Emsworth.

The Emsworth Gas and Coke Company, Ltd., like many other undertakings owning small works, had, prior to December, 1922, a horizontal installation as the sole means for the production of gas. This installation consisted of one bed of eight and one of six retorts, on the regenerator system, hand-charged. The purifying capacity was ample for an increase of at least 25 p.ct. by volume of gas. As with most other companies during the war, the calorific value of the gas was greatly reduced; but the consumer continued to obtain satisfactory results with this gas.

With the reversion to normal conditions throughout the country, gas consumptions tended to increase; and the Company were faced with the difficulty of carrying on operations to meet an increased output. An addition to the carbonizing plant would have entailed considerable inconvenience, and a serious increase in capital expenditure for a small company. The Board, advised by Mr. T. N. Ritson, of Chichester, and their Engineer (Mr. Jones), came to the conclusion that their best policy, in order to meet the emergency, was to instal a blue water-gas plant, if one of small enough capacity could be obtained.

With the limited amount of labour and technical supervision that is usual on a small works, there was some doubt as to whether the water-gas plant could be run efficiently by the staff available. It was also felt that it would be of advantage if a certain amount of carburetting could be employed; but if this should tend seriously to increase the capital outlay, it could very well be dispensed with.

SYSTEM OF BRITISH FURNACES, LTD.

The capacity of plant called for was one having a make of about 1400 c.ft. of 290 B.Th.U. blue water gas per hour. It was soon discovered that there were not many systems available of this small capacity; and after considering details of two, it was decided to instal the plant offered by British Furnaces, Ltd., of which there were a large number working in different parts of the world, but so far none in this country. This decision was come to largely on account of the low capital expenditure, and the prospective ease of working the plant; and also because of the very definite and close guarantees given by the makers.

The Glb. size was installed, and started-up in December last. This plant has a guaranteed capacity of 1400 to 2100 c.ft. per hour; the higher figure being based on short periods without clinkering, and the lower as an average for the 24 hours. The guarantees also included:

1.—That the plant should be a satisfactory gas-making unit.
2.—That the calorific value of the gas should be 290 B.Th.U.
3.—That for each 1000 c.ft. of water gas, not more than 40 lbs. of coke would be required, which coke should not contain less than 86 p ct. of carbon, or have a moisture content of more than 5 p.ct.
4.—That the steam consumption for gas-making purposes should not be greater than 52 lbs. per 1000 c.ft. of gas.

A guarantee was further given that, should the plant not prove satisfactory as a gas-making unit in reasonably fulfilling the above conditions, it should be removed, and all payments refunded.

As already mentioned, the plant was started-up at the end of December last; and from that date until the present time, there has been no difficulty in obtaining an average make of 2500 c.ft. of gas per hour, having a calorific value of 300 B.Th.U. The guarantees as regards steam consumption and coke used have been easily fulfilled. A youth without previous experience has to date run the plant, under the supervision of the Engineer.

ARRANGEMENT OF THE PLANT.

The plant consists of a generator 3 ft. diameter and 6 ft. high, carefully riveted and corked, having a clinkering door with support for false bars, and an ash door with clamp bar and bolts. The stack valve and bell in the coke-charging hopper are one and the same piece of apparatus. The generator is lined with firebrick of first-class material. Between the shell and the generator is ample insulating material. Arrangements were made for up-run and down-run; and there is consequently a gas take-off at the top and bottom of the generator.

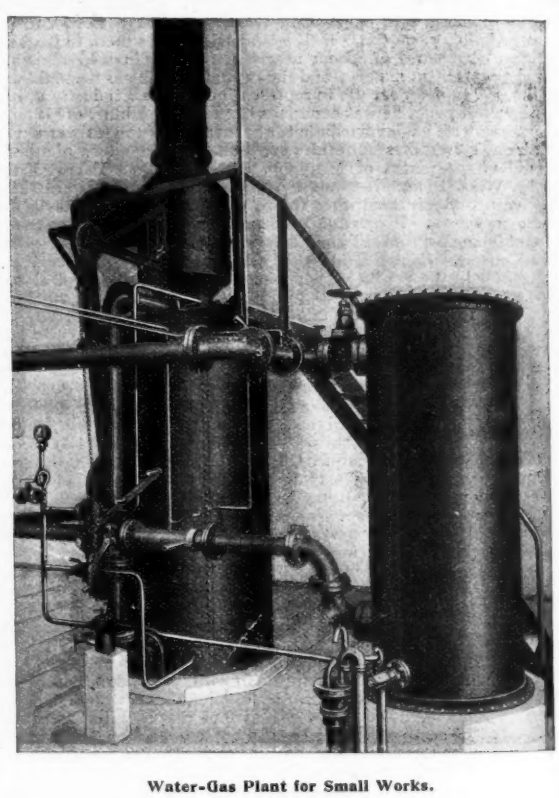
The plant is operated solely by a single lever; and the movement of this lever to one of four positions in a half-circle regulates blow, up-run, down-run, or neutral position. It will therefore be realized that, in one operation, steam, blast, and gas are each regulated; and the timing is such that there is no possibility of mixing one or other of these fluids.

The fan is driven by a 3 H.P. high-speed steam-engine of the Robey type. The gas made passes through a coke scrubber 2 ft. 8 in. in diameter and 6 ft. high, which is provided with a dip-pipe and two cleaning covers, a wood grate, and overflow pipes. The operating stage, consisting of strong chequer plates, with ladder and railings, is 15 ft. square. A stack 16 ft. high, 2 ft. 4 in. in diameter at the base, and 1 ft. at the top, is also required. Two 30-in. pressure gauges mounted on a board, with thermometer and steam gauges, were installed as usual. The ground space occupied by the plant, allowing ample room for the operator, is not more than 14 ft. 9 in. by 11 ft. 6 in.

When the plant was first started-up, it was found that the steam supply was very wet, and that more than half the steam on the up-run was not available for gas making; and on the down-run the large quantity of hot water very considerably damped the fire. A small coil superheater was therefore installed close up to the plant; and this was coke fired. The degree of superheating was not more than was necessary effectively to dry the steam to the extent of about 50° C. The gas leaves the coke scrubber at a temperature of about 20° C., and passes by way of a 3-in. main to a holder that is available for the purpose. The water gas is introduced into the crude-gas main at the inlet to the condensers on the coal-gas side.

RESULTS.

From the time of the introduction of the water-gas coal-gas mixture, it has been noticeable that the illumination obtainable from incandescent burners in the district has been much improved. It has also been possible to run the coal-gas plant more efficiently, as slight over-pulling has been dispensed with—it



Water-Gas Plant for Small Works.

having been found that with a higher quality coal gas it was possible to use a larger percentage of water gas. As the cost of making water gas per therm is not higher than that of making coal gas, the two plants can be run in such proportions as will enable the Engineer to distribute a gas of 470 B.Th.U.

The coke that is used is of good quality. During the summer months it is only necessary to run the plant at such periods as are required for the purpose of filling-up the water-gas holder; the coke in the generator being sufficiently hot to enable it to be run if needful about one shift a day. Clinkering, so far, has given no difficulty; and after six months' intermittent running, the lining is practically as good as new.

After the plant had been started-up, and was found to be working entirely satisfactorily, a small and inexpensive attachment was made to the generator, by which it became possible to carburet the blue water gas to the extent of at least 1 gallon per 1000 c.ft. of gas. Under these limited conditions, the gas oil was cracked as efficiently as in a specially constructed external carburettor and superheater, without the additional expense. The enrichment was equal to an increase of 100 B.Th.U. per c.ft. for 1 gallon of oil, though it has not been found necessary to use this quantity of oil per 1000 c.ft. Even this limited amount has enabled the Engineer to turn-out a bigger quantity of water gas than would otherwise have been possible.

NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION.

AUTUMN MEETING AT BRIDLINGTON.

Bridlington could not be termed an easily accessible place; and before the meeting of the Association there last Friday one heard many remarks on the undesirability of early rising. But thoughts of this nature found no expression after the meeting, which proved to be of exceptional interest; and in spite of the National Gas Exhibition at Birmingham, there was a good attendance of members of the Association, who gathered to hear the Presidential Address of Mr. JOHN KELLY, and a topical and highly suggestive paper on "Considerations Relative to the Future of Sulphate of Ammonia," by Mr. R. C. TAYLOR, B.Sc. Mr. Taylor's paper formed the subject of much valuable comment; and the remarks made by Dr. Weyman, and those of Mr. Pease, who briefly described the "N.P.K." fertilizer (particulars of which were given in the "JOURNAL" for June 20, p. 742) and afterwards exhibited specimens, will be read with interest.

THE COMPANY'S WORKS.

The reason why the Bridlington Gas Company are able to supply gas at a very low cost, has often puzzled gas engineers; but an inspection of the works proved this to be due to two main factors—the careful scientific supervision of every detail of the gas-making process, and a lucrative disposal of the bye-products. Everything produced, including the clinker, is sold to the best advantage. Fundamentally there is no difference between such large concerns as the South Metropolitan and the Gas Light and Coke Companies and many small ones throughout the country. The large Companies mentioned owe their success in no small measure to the attention given to the minutest detail; and if this delicate control were applied in the most practical way to small undertakings, the results would in many cases be startling—as is evidenced by those of the Bridlington Gas Company.

An outlined description of the works is given in Mr. Kelly's address; but there are a few features of particular interest which may be noted here. One of these is the highly effective means adopted to obviate the nuisance of "fliers" and acid fumes in the waste gases of the water-gas generators. This device consists of a hollow cylinder placed above the blast stack of the generator, so that the gases during the blow period must travel through the cylinder before making their exit into the atmosphere. Inside the cylinder is a cone which serves to deflect a spray of water on to the wall. During the blow period, the waste gases have to pass through a continuous sheet of water, which dissolves the sulphurous vapours, and frees the gas from gritty particles.

Two boosters of the Bryan-Donkin type, fitted with De Laval steam-turbines, are installed for ensuring an adequate supply of gas at periods of maximum demand. One is of a capacity of 150,000 c.ft., and the other of 250,000 c.ft. per hour; and each is capable of raising the pressure of this volume to 12-in. water-gauge. Another item of interest is a continuous tar dehydration plant manufactured by Messrs. Chambers and Hammond, which, though having a specified capacity of 5 tons of crude tar per hour, works regularly and with ease on a throughput of 6 to 6¼ tons. The Company have their own artesian wells, from which water is taken to supply all the needs of the works.

THE BUSINESS MEETING.

Mr. JOHN KELLY (Engineer, Secretary, and General Manager of the Bridlington Gas Company), the President, occupied the chair at the meeting.

GAS ASSOCIATIONS REPORTS.

The PRESIDENT said there had been correspondence between Mr. Rogerson, the Hon. Secretary of the Manchester District Association, and the Editor of the "GAS JOURNAL" with regard to the suggested printing of the "Transactions" of the District Associations. A few years ago, before printing was so expensive, the "Transactions" of the various Associations had been issued in book form, and it had been the custom of their Association to present copies to the members. There was no doubt as to the value of the publication, especially for reference from time to time. They wished to ascertain whether the members desired the re-issue of the "Transactions," as before the war. It might be desirable to circularize the members to ascertain their views. He suggested that those present might, by a show of hands, indicate whether they approved the resumption of the publication.

Fifteen held up their hands in favour.

The HON. SECRETARY (Mr. Norman S. Cox, of Sunderland) suggested that the various undertakings should purchase copies of the publication for the use of their staffs.

The PRESIDENT said the only possibility of the resumption of the publication was for members or their undertakings to promise to subscribe for the volume. They had not had enough support, he was afraid, to justify their circularizing the members on the question; but perhaps on reconsideration they might think it worth while. It would not be possible to increase the subscriptions without special notice, and he did not think it would be advisable; but the members might obtain authority for their own undertakings to subscribe for the publication. He hoped it might be possible in a few years for the Association again to circulate the volume free to the members.

Eventually it was decided to circularize the members.

THE UNEMPLOYMENT GRANTS COMMITTEE.

The PRESIDENT referred briefly to the circular issued by the Unemployment Grants Committee of the Government (to public-utility companies), stating the general conditions under which grants might be made. He did not think the offer made could be of much use to gas companies, though it might be to corporations. They sympathized with the object; but it did not appear practicable.

THE EDUCATION SCHEME.

The PRESIDENT, referring to the Education Scheme, said it was being fully considered; and it would be a good thing if any of them could use their influence to arrange for the setting-up of authorized centres for the purposes of the scheme. In somewhat isolated places like Bridlington and the majority of North of England towns it would be very difficult to take advantage of the Education Scheme, except for students applying for special examinations. He hoped the members would give their aid to the setting-up of as many centres as possible.

The PRESIDENT then delivered his

PRESIDENTIAL ADDRESS.

In again thanking you for electing me to the Presidential Chair of your Association, which so many able men have filled, I crave your indulgence where I may be found wanting, and your assistance to make my year of office a success.

Before asking your attention to matters of more general interest, a brief survey of the undertaking I have the privilege to serve will not be inappropriate to the occasion. The Bridlington Gas Company was formed in the year 1836, and was incorporated by a special Act of Parliament in 1886. The works were founded on a site near the junction of Swindon Street and Quay Road. They were removed to their present position in the year 1860, where, chiefly under the direction of Mr. George Brambles as Managing Director, the Company have very successfully rendered good service to the community. The Company's area of supply covers Bridlington, Bessingby, Flamborough, and Sewerby-cum-Marton; but the borough of Bridlington and a portion of Bessingby Parish are the only parts of the district that have as yet been supplied with gas. About 23 miles of distribution mains have been laid.

There are no particularly novel or extraordinary engineering features about the works; indeed they are, what is now rather unusual for an undertaking of the size, a hand-charged horizontal-retort works, coupled with carburetted water-gas plant, for which they are eminently suitable.

No. 1 retort-house contains six beds of six and four beds of eight, all 21 in. by 15 in. by 10 ft. ⏢ shaped retorts fired by ordinary grate bar furnaces with shallow regenerators. No. 2 retort-house has seven beds of six similar retorts fired by step-grate furnaces and single-lung regenerators with six rows of tubes. Each bench is fitted with a separate governor on the foul main, giving excellent control of the pressures in the retorts, notwithstanding that carburetted water gas is mixed with the coal gas at the inlet of the exhausters. The two exhausters are both belt-driven by gas-engines. One has a capacity of 50,000 c.ft. and the other of 30,000 c.ft. per hour. A Livesey washer, of a capacity of 1 million c.ft. per day, and two washer scrubbers, workable either in series or in parallel, rated at 750,000 c.ft. per day each, deal with wet purification. The dry purifiers consist of four boxes, each 25 ft. by 19 ft. by 5 ft. 6 in. deep, with dry covers, and three catch boxes, each 20 ft. square, with water-lute covers.

There are two service holders having a total capacity of 544,000 c.ft., and a 70,000 c.ft. relief holder in connection with the carburetted water-gas plants, which comprise one 200,000 c.ft. and one 150,000 c.ft. per day Humphreys and Glasgow set. A second turbo-booster of 250,000 c.ft. per hour capacity at 12 in. pressure difference has been installed, in addition to the 150,000 c.ft. set I had the pleasure of describing to you last year.

The coal-gas station meter is of the rotary type, of 60,000 c.ft. per hour capacity. The carburetted water-gas station meter is a 30,000 c.ft. per hour one, of the usual wet-meter type.

Coal is delivered in hoppered wagons by means of two railway sidings into covered cells underneath the rails—alternatively at rail level, which is about 8 ft. above that of the yard—for conveyance either into a covered store capable of holding about 700 tons, or for stacking in the open air. The total covered storage capacity amounts to about 1400 tons. Much outgoing traffic can also be dealt with at the sidings, which accommodate eight or nine wagons each, though up to now no mechanical handling appliance has been installed.

A continuous type tar-dehydration plant is in use, capable of dehydrating about six tons of crude tar per 8½-hour day. Here

I may say that, while not a frequent occurrence, priming of the still does sometimes occur, a certain degree of working skill being required to prevent this.

A more or less novel, certainly very efficient, blast-products purifier has been installed in connection with the carburetted water-gas plant. It would be somewhat tedious to read a description of it; and it is quite a simple contrivance. Those who may be interested will probably prefer a verbal explanation on the site.

I do not propose to occupy your time with a general statement of working results, but will merely say that the yield of therms per ton of coal carbonized over the years 1921 and 1922, excluding therms derived from the gas oil used, was 88. The progress of the undertaking during the past 50 years is well illustrated by the following figures:

Year ended Dec. 31.		Make as per Station Meter.
1872	..	10,407,100
1882	..	20,716,300
1892	..	38,314,000
1902	..	89,564,400
1912	..	138,390,900
1922	..	202,125,300

The maximum daily output is well over 800,000 c ft.

The price of gas has always been moderate. In 1886, when the Company were incorporated, the price was 3s. 4d. per 1000 c.ft. It fell to 2s. 11d. in 1889, to 2s. 9d. in 1899, increased to 3s. 2d. in 1901, fell to 2s. 11d. again in the following year, was reduced to 2s. 8d. in 1904, to 2s. 6d. in 1905, to 2s. 4d. in 1906, and to 2s. 3d. in 1907. The price remained at 2s. 3d. until August, 1919, when it rose to 3s. The following year it again rose, finally reaching the peak price of 3s. 6d., at which it remained for only six months. From this figure it has fallen by degrees to the present price of 7d. per therm, the equivalent of 2s. 11d. per 1000 c.ft. According to the latest available statistics the number of houses in the borough of Bridlington is about 4380. At the end of 1922 the number of gas consumers amounted to 4286, and nearly 3000 cookers and grillers are let out on hire by the Company. In addition to these, many are owned by consumers, so the ratio of cookers to consumers is fairly high.

To pass on to affairs of more general interest, whatever may be the case with others who may walk this earth well shod, there is "nothing like coal" to the gas engineer. Nevertheless, during the unforgotten coal stoppage in 1921, there was to be seen on railway locomotives an importation that looked like coal but acted quite effectively as a partial fire extinguisher; and eloquent dissertations were heard from gas manufacturers who tried their skill on the same so-called coal and failed ignominiously to gasify it. Immediately after that deplorable event, the quality of English gas coal deteriorated to the level of the worst war years. It has improved somewhat in the interim, but shows a regrettable tendency in some cases, not in all, to lapse from the virtuous path, to increase in ash content and decrease in valuable constituents, at times when spot and export prices exceed contract ones. It would be unjust to say that these remarks apply universally; there are collieries that supply coal of very uniform quality. Certain collieries are said to contract to supply coal with an agreed maximum percentage of ash. I have heard of one that will agree a minimum as well as a maximum ash percentage, with a neutral zone of 2 p.ct. which bears no penalty to either party. These contracts seem to be based on sound principles. Common agreement ought surely to be possible, to secure that the gas industry should not perforce have to buy an excessive quantity of inerts at the price of good coal, while at the same time it is not permitted to charge anything at all for inerts in the gas produced from such coal. No doubt in the long run a "dirty" coal will suffer in price; and in the final analysis improvement will depend on whether a sufficiently increased price could be obtained to pay for the cost of eliminating the excessive ash. In this connection it should be remembered that if a reduction in ash content be accompanied by a corresponding or greater percentage increase in moisture, the value of the coal for gas making is unlikely to be increased. The resultant coke would probably be improved, however.

I should not like to think that the views of a certain colliery representative, who unsuccessfully tried to induce me to sample his wares, were common to the coal trade. He considered any coal with 4 or 5 p.ct. of ash to be a house coal, and said he would never dream of selling such a coal as gas coal. Moreover he called his Yorkshire gas coal first-rate, although it had an average ash percentage of 8 or 9. None of us, any more than his competitors, will support this opinion; and I feel sure he must find buyers scarce. Evidently the fact that at the time he spoke (quite recently) house-coal prices were some 10s. per ton higher than those of gas coals, determined his classification. However absurd it may be that a reduction of only 4 or 5 p.ct. in ash should entail an increase of 30 p.ct. or more in price, and alter the description of the coal from "gas" to "house," the statement was made emphatically, and repeated, apparently in all sincerity.

Before leaving this topic, I would refer to the anomalous difference between the sliding-scale that regulates miners' wages and coalowners' profits and the one that regulates the dividends of sliding-scale gas companies. In the former, the higher the price of coal the higher the miners' wages and the owners' profits; the lower the price of coal the lower the wages and profits. There is therefore every incentive to obtain as high a price as possible from the user; and since cost of production is a factor in the price, the tendency under such a slide must be to increase the cost of production. Under the gas sliding-scale this tendency is exactly reversed, because the higher the price of gas the lower must be the dividend to the shareholders, while the lower the price of gas the higher may be the dividend. It must be obvious to the meanest intelligence that here the common interest of both the gas undertaking and consumer alike lies in securing as low a price as possible for the gas, and that no effort to that end is likely to be spared by those concerned in the gas industry. If this reasoning be sound, the converse must hold for the coal industry; and since the conditions in the railway world in respect to wages, traffic rates, and dividends are more or less analagous to those in coal mining, the same reasoning will apply there. It will be a happy day for the world when the interests of buyers, sellers, and workers in all industries are common, in the production and sale at the lowest possible price of all the necessaries of life, as is the case with gas in the industry in which we are engaged. Would that it might even be thought probable that the day will be seen!

After coal and its gasification, probably the most important technical interest of gas men lies in residuals or bye-products. When Europe abandons political strife and again settles down to normal work, coke and tar may prove difficult problems for us; and the cost of coal *less* residuals may present a very different aspect from the present one. Ammoniacal liquor is a pretty conundrum now from both technical and financial points of view, owing to recent and projected developments in regard to synthetic nitrogen, and may not for long prove so serviceable to us as in the past. Whether our line of advance lies in the direction of progress towards complete gasification of coal or otherwise, may possibly be determined by these factors, rather than by technical ones connected with the various respective methods of gasification in externally-fired vessels. Incidentally I would draw attention to the advisability of regarding all claims to remarkable advance in the efficiency of gas production with a certain degree of caution. There is a technical efficiency and also an economic efficiency in all systems; but the two do not always by any means coincide. With regard to technical efficiency it may be well to reflect on the limits of the possible increase of efficiency in any type of externally-fired gasification plant, on the fact that total gasification is a misnomer when applied to any internally-fired plant that has yet been tried on a working scale, and on the implications that follow.

Except by the use of oxygen it seems improbable that any internally-fired plant can improve very much on the efficiency of the ordinary water-gas plant with waste-heat boiler. It therefore appears to me that possibly the most immediately promising course is to attempt to utilize the sensible heat of water gas for carbonizing coal by some system in which the retort is heated both externally and internally; always bearing in mind that technical efficiency may be dearly bought at the expense of economical efficiency.

The heat used and lost in manufacture is stated in the "Clerk, Smithells, Cobb Report" to be 23·2 p.ct. of the total heat in the coal carbonized. It must always be difficult to reduce or prevent heat losses by radiation from the settings, by convection, and by the sensible heat of the coke extracted from retorts; and a certain quantity of heat is required for chimney draught. When the percentage of heat necessary for these purposes is deducted from the 23·2 p.ct. referred to, the limits of the possible increase in efficiency cannot be wide—especially since these figures apparently include the energy used for mechanical purposes connected with gas manufacture, where economic efficiency may be of far greater importance than the mere gaining of a slightly higher technical efficiency. While, therefore, I am one of those who think that advance in the technical efficiency of gas production will be more difficult in the future than it has been hitherto, notwithstanding the advance in the scientific education of our personnel, and this because the limits have become so narrow, I also think that by careful observation of the course of events outside, but having influence on our industry, and by intelligent prevision, we shall maintain and possibly increase our economical efficiency, which as you all know is in the front rank of systems concerned with the utilization of the energy contained in coal.

Now economical efficiency cannot be increased, but it is always retarded in greater or less degree by both essential and unessential restrictions, either in relation to manufacture or supply. They all tend to increase the cost and lower the economical efficiency of gas, in the narrow sense at least. It is therefore unwise and scientifically bad to impose or to agree to the imposition of any unessential restriction whatever. The same reasoning applies, *mutatis mutandis*, to unnecessary tests. So long as the industry is governed financially in the interests of the consumer, either by the sliding-scale or maximum price enactments, all tests having for ostensible object the protection of the gas consumer must by the exact amount of their additional cost defeat that object. There are tests which ought to be imposed on the gas undertakings—those having regard to the public health (*e.g.*, the sulphur test). The true interests of the public necessitates that test, and whatever the cost may be it ought to be performed. It is otherwise with tests purporting to protect the economic interest of consumers and public. As already stated, these tests entirely and necessarily defeat their object.

When the Gas Regulation Act was passed, it was understood that one of its purposes was to reduce the expense of obtaining parliamentary powers. The recent alteration of standing orders, and the decision of Parliament to consider objections to Board of Trade Draft Orders under section 10 of that Act, bid fair,

however, to make procedure by Special Order more costly than by Special Act, as an opposed Order may have to be contested twice—first at the Board of Trade, afterwards in Parliament. Endeavour should certainly be made to obtain a reversion to the earlier form of procedure under the Gas Regulation Act, in the interests of the consumers who, of course, have eventually to bear the extra costs incurred by the gas undertaking. Or, if this be found impossible, vexatious or frivolous opposition ought to be discouraged by not permitting an unsuccessful opposition to a Board of Trade Draft Order to be charged against any public fund or included in any rate.

At the recent congress of the Royal Sanitary Institute at Hull, several papers were read which touched upon the advantages to the public health to be derived from the extended use of gas for domestic purposes. A remarkable one on the "Smoke Evil," by Prof. J. B. Cohen, of the University of Leeds, illustrated by lantern slides in a most telling way the injurious effects of smoke, not only on living vegetation, but even on the stonework of buildings. Statistics were quoted showing the deleterious effect of smoke on human life. The Professor's researches proved that in industrial towns domestic chimneys are in the aggregate far greater producers of the most destructive smoke than are those of factories. That gas can solve the problem of the smoke from domestic chimneys is well demonstrated in the summer season at Bridlington by the fact that at midday, when domestic cooking is in full swing, scarcely a wisp of smoke can be seen coming from a house chimney in any part of the town. Few houses are without a gas-cooker of some description; and both the clear atmosphere and the midday output of gas speak eloquently of the results. There is no other agency doing so much as gas to abate the smoke nuisance at the present time; and the benefit in this direction to the public health to be obtained from the extended use of gas-cookers and gas-fires cannot be too much emphasized. Glance up at the clear air that has been secured in health resorts and watering places by the use of gas cookers and fires, and then imagine the difference in the atmosphere that would ensue if those thousands of chimneys were to belch forth smoke for an hour or so about noon each day. In winter, when the sun shines for so short a time, it is perhaps even more important from the public health standpoint not to cut off any of its life-giving rays. Yet this is a necessary consequence of the use of raw coal. Here is a great opportunity for the gas-fire to add to the useful public service rendered by the gas industry; one moreover that will grow in extent as the price of gas is reduced.

The idea that it exists primarily in the interest and for the service of the public has been characteristic of the gas industry. We in Bridlington are glad to feel that ratepayers and consumers appreciate this, as became evident when the question of the acquisition of the gas undertaking by the Council was recently under consideration. You may be sure that every effort will be made to retain and increase the goodwill of the town.

In all that relates to the utilization and distribution of gas there is considerable and increasing efficiency. I look forward therefore with confidence to great and continuous growth in the magnitude and variety of the services to be rendered to the community by the industry in which we are employed.

To conclude, I have to say on behalf of my Directors that they join me in appreciation of your choice of Bridlington for this meeting, and offer you a sincere welcome. They hope that, besides furthering the objects of the Association, your first visit to this well-known northern watering place may be pleasurable to you.

Mr. SHADBOLT proposed a vote of thanks to the President for his address. He had made a modest reference to the Bridlington Gas-Works, of which he was the able Manager; but whatever Mr. Kelly might say about them, there was no doubt that they made wonderfully cheap gas. ["Hear, hear."] They were grateful for the opportunity they had received of visiting Bridlington, and seeing the undertaking which Mr. Kelly controlled with marked ability. He had great pleasure in moving a vote of thanks to the President for his address.

Mr. J. E. MORFETT seconded.

The PRESIDENT briefly acknowledged the resolution.

Mr. R. C. Taylor, B.Sc., (Gas Eng.), then read a paper entitled "Considerations Relating to the Future of Sulphate of Ammonia," which, with the discussion and the remarks on the "N. P. K." fertilizer, will be published next week.

VOTE OF THANKS.

Thereafter, Mr. DOIG GIBB said it was a great pleasure to propose a vote of thanks to the Chairman and Directors of the Bridlington Gas Company. Everyone who knew anything about the industry and about gas-works, knew that the Bridlington Gas Company were a wealthy and progressive Company, and not less so because of the position of Mr. Kelly as their Engineer and General Manager, and of Mr. Taylor, who had read such an excellent paper. The Company had recently obtained a Special Order, under the Board of Trade; and it had been the longest and most voluminous he had ever had to deal with. Mr. Kelly seemed to have collected every precedent, and every clause in every Act of Parliament in the last sixty years; and it had certainly educated him to know what was possible, and what precedents there were for this clause and that clause, and though he could not speak for the Parliamentary agents, he believed they also had been impressed by Mr. Kelly's powers. The result was that he got a long, and also a very complete, Order; and he would not want another for many years to come. He had pleasure in proposing the vote of thanks.

Mr. C. F. BLINCOE, Middlesbrough, seconded.

The PRESIDENT said he would have pleasure in conveying their appreciation to the Directors.

A CHARABANC RUN AND VISIT TO THE GAS-WORKS.

After tea, by invitation of the Chairman and Directors of the Bridlington Gas Company, the members enjoyed a charabanc run in the district, paying a call at the famous old "Priory Church," and also visiting the Company's works.

MECHANICAL GRATE WATER-GAS PRODUCERS.

The difficulties attached to clinkering by hand in water-gas producers, especially those of very large capacity, is well known. It is therefore of interest to note that the mechanical grate water-producer gas built by the Power-Gas Corporation, Ltd., of Stockton-on-Tees, has proved itself in practice satisfactory, in so far as hand clinkering is eliminated. In one of their recent plants, the Power-Gas Corporation carried out trials during which demonstration runs of 48 hours were made. The water-gas producer was found to be as free from clinker at the end of the run as at the commencement; all the clinker having been removed, as formed, by means of the mechanical grate.

At the same time, working under these conditions, the producer was most efficient, inasmuch as the amount of carbon (as coke) consumed per 1000 c.ft. of gas equalled 26·2 lbs.; the gas having a composition as follows:

CO_2	6·1
CO	39·7
H_2	48·3
CH_4	1·5
N_2	4·2

The average half-hourly samples of blow gas showed 14 p.ct. of CO_2. The rate of working during the demonstration test was 1½ million c.ft. per 24 hours per generator unit; but arrangements are being made to increase the rate to 2½ millions per 24 hours per unit—thus making the yield per producer the largest of any hitherto attained in this country.

Carbon Monoxide and Smoking.

Tests recently concluded by experimenters of the United States Bureau of Mines at Pittsburgh prove, so it is said by the "Gas Age-Record," that so far as carbon monoxide is concerned, one may smoke in a confined space anything from super-dried cabbage to the finest long-filler Havanah without the slightest danger. The intensive studies of carbon monoxide made in this laboratory have brought out many little-known facts; and in the course of general investigations relative to gas hazards in mines, factories, and homes, three men were confined, with a miscellaneous smoking tobacco of all kinds, in a room of about 1000 c.ft. The three men puffed away for an hour and a half at cigarettes of every variety. Following this, the smokers drew energetically upon a variety of cigars, &c.; and finally they did the same with pipes of different kinds, until the air in the enclosed chamber had become so dense that it was impossible to see across it. The atmosphere was so irritating to the eyes that it was necessary to wear goggles. Samples of the air and of the blood of the experimenters were taken for analysis. It was found that the maximum blood saturation was only 5 p.ct. Some of the experimenters inhaled the smoke; but the tests indicated that such inhalation, though it may have extended to the bronchial tubes, did not penetrate the lungs. The tests indicated that carbon monoxide hazard from smoking indoors or in mines is negligible in itself, though the Bureau of Mines investigators consider it may add to the smoker's hazard should he be caught by carbon monoxide from sources such as occur in the mining industry.

Manchester and District Junior Gas Association.—A visit to the Burnley Gas-Works has been arranged for Saturday, Oct. 6. Members are requested to assemble at the general offices at the gas-works, Parker Lane, at 2.45. Tea will be provided by the Chairman and members of the Gas Committee.

A Low-Temperature Process Calculation.—During a tour of inspection, one of the Engineers of the Ford Motor Company gave some interesting calculations with regard to the Caracristi and Piron lead-bath low-temperature process (particulars of which appeared recently in the "JOURNAL") being installed at the works. He stated that they would be able to make gas for 7½ c., instead of 50 c. or 60 c., per 1000 c.ft., which was the production cost at present. In addition to this, they would secure light oil, suitable for use as a gasoline substitute, for 7·3 c. per gallon, and sulphate of ammonia for less than 2 c. per pound. Further, there would be a heavy oil residue which would cost them 2·5 c. a gallon, and could be re-distilled into a gasoline substitute for 6 c. a gallon. There would be creosote oil for timber preservation at a cost of 7 ., and a heavy fuel oil for 3·5 c. a gallon. The coke produced would come off in sheets at the rate of 25 ft. a minute. This sheet coke was easily pulverized, and, when mixed with a suitable binder, would make an excellent fuel briquette adapted for domestic use. This fuel could be burned in a house furnace instead of anthracite, and could be distributed for one-half the cost of anthracite.

AN ASSOCIATION FOR THE IMPROVEMENT OF PUBLIC LIGHTING.

A conference of Lighting Superintendents and those concerned with public lighting throughout the country was held in the Conference Hall of the National Gas Exhibition last Friday. The chair was taken by Mr. CHAMBERS-SMITH, Editor of "Municipal Engineering." Among those attending were Mr. E. Spurrell (Engineer, Holborn Borough Council), Mr. W. J. Liberty (Lighting Superintendent, City of London), Mr. S. B. Langlands (Lighting Superintendent, City of Glasgow), Mr. R. Mason (Lighting Superintendent, City of Birmingham), Mr. Crane Cooper (Wakefield), Mr. Thomas Wilkie (Leicester), Mr. Isaac H. Massey (Distribution Superintendent, Oldham), and others responsible for the lighting of various important towns throughout the kingdom. There were also present Mr. R. J. Rogers (of the Birmingham Gas Department), and Mr. W. M. Mason (Manager of the British Commercial Gas Association).

Mr. W. J. LIBERTY read the following short paper, entitled—

PROPOSED INSTITUTION OF PUBLIC LIGHTING SUPERINTENDENTS.

In reply to a request asking my opinion as to the best means of meeting the requirements of public lighting throughout the country, I am suggesting that the solution lies in the formation of an Institution or Association of Public Lighting Superintendents. I am reminded of the saying of the wise man in the ancient book—*i.e.*, "To the making of books there is no end." Should I be wrong in substituting "institutions" for the word "books?" There are at present so many institutions, associations, and societies in being, many of which deal with the same subject, that one is, in these days of "full steam ahead," unable to attend all the meetings or read the amazing amount of literature issued in the form of "magazines," "journals," and "papers;" and one feels that an additional institution would naturally give rise to over-lapping.

I quite agree with the views of Mr. C. S. Shapley, the Engineer and Manager of the Leeds Gas Department, that "up and down the country there are more disgraceful exhibitions of street lighting than those which reflect credit." Recently I attended a rural council meeting in the South of England, where the roads lead to several important coast towns. These roads were choked with motor cars, lorries, and other forms of motor-driven traffic. The meeting of the council was called to consider the lighting of the roads for the winter months (there had been no public lighting since April 1). Only four persons turned up; and with the sole idea of saving a few pounds, the meeting decided to light only half of the existing lamps, and "turned down" an offer of the local gas company for converting the old, and very obsolete, type of upright burners to modern inverted ones—and this in a town which has the most tortuous, narrow, and "dog-legged" streets one could possibly find. There seemed to be no one present at the meeting to give a lead or advise as to the gas company's offer, with the result that the resolution to half light the town and its approaches, and badly at that, was agreed to.

Whether such samples of bad lighting could be improved upon by bringing into being yet another organization—or, rather, by using the means already at hand—is a matter for debate. At present there is the Illuminating Engineering Society in London, collaborating with the Institution of Gas Engineers, the Institution of Electrical Engineers, and the Municipal Engineers and County Surveyors; and they have already tackled the matter—the results being published in pre-war time in the form of a paper by Major Trotter, which is considered a "classic" on the subject—namely, "The Standard Clauses of Street Lighting Specifications." The Institution of Gas Engineers, and kindred societies, have a Standing Committee in existence watching and periodically reporting upon the subject; the representative of the gas industry being Mr. R. Watson, of Doncaster. The Public Works, Roads, and Transport Congress have also dealt with the matter in co-operation with the Municipal and County Engineers, and have had papers read before them.

There is, in my opinion, enough material existant for the work of co-ordination of the public lighting of our highways up and down the country, if the authorities responsible under the Lighting and Watching Act would only carry out its provisions generously. In these days of fast mechanically-propelled traffic, it has become imperative that action should be taken by such authorities to put an end to what is a positive danger to all users of the highway—some of which highways have no lamps on them for miles, not even at dangerous cross roads. Even in large towns and cities, there is a lamentable lack of co-ordination in the public lighting. For instance, the public lighting of the Metropolis is under the control of no less than two Cities (London and Westminster), 28 Borough Councils, the London County Council for their bridges and embankments, and H.M. Office of Works for the Royal Parks and Government Buildings. In some cases in the Metropolis, the municipal boundaries run down the centre of thoroughfares having electric lamps on one side and gas on the other, neither bearing any relation to the other in illumination, spacing, or height of light source.

Doubtless the coming together of those interested in this particular question could not fail to have good effects; and judging from the correspondence that has been appearing in the Municipal Press, there seems to be a desire among those responsible for our public lighting for some form of institution or association where they could foregather in conference, and consider those questions which concern their calling, with a view to the betterment of the public lighting—especially in our main roads, so that the lighting of them might bear some relation to the lighting of the side turnings.

With regard to the former, as a great deal of the fast and heavy motor traffic is on the roads at night, there is need of good illumination, if the great toll of accidents, with its accompanying loss of life, is to be avoided or lessened, particularly in the country, where the roads are both narrow and crooked, and where lighting only takes place in the winter months.

Should there be sufficient desire among those responsible to warrant the formation of such an institution, I should be willing to lend any aid in my power. Among those who are in favour of this course (judging from their letters) are Mr. C. S. Shapley (Engineer and General Manager, City of Leeds Gas Department), Mr. Isaac H. Massey (Distribution Superintendent, Oldham Corporation Gas-Works), and Mr. Crane Cooper (Lighting Superintendent, Wakefield). Mr. Davison (Lighting Superintendent, City of Newcastle-on-Tyne), I understand, thinks the existing organizations meet the requirements. The question of where the home of the proposed institution should be—London or the provinces—how often to meet, and expenses, are matters to be considered after deciding on the main point.

ASSOCIATION INAUGURATED.

At the conclusion of the paper, the meeting was addressed by Mr. Langlands, who spoke from his experience of Glasgow, and confirmed what Mr. Liberty had said in his paper about the need for better lighting in the country generally. He was followed by Mr. R. J. Rogers, Mr. W. M. Mason, Mr. Crane Cooper, and Mr. Massey.

Mr. LANGLANDS moved, and Mr. R. MASON seconded, a resolution that an organization be established for the improvement of public lighting, consisting of those responsible for it.

It was next decided that Mr. Crane Cooper (Wakefield) be Hon. Secretary; while Mr. S. B. Langlands (Glasgow) was elected President, and Mr. W. J. Liberty (London) Vice-President. It was arranged that the fee at present should be 10s. 6d. per annum.

A Committee to draw up the constitution, frame bye-laws, and determine the class of persons eligible for membership were elected, consisting of Messrs. Langlands, Liberty, Crane Cooper, Mason (Birmingham), Wilkie (Leicester), Spurrell (Holborn), and Chambers-Smith (London). It was left to an Executive Committee, consisting of the President, Vice-President, and Hon. Secretary, to carry out the details and arrange for the first meeting.

A vote of thanks to Mr. Chambers-Smith for calling the meeting and presiding terminated the proceedings.

One of the objects of the Association will be propaganda and educational work among the authorities responsible for public lighting throughout the country, to induce them to appoint some person to be definitely responsible for the public lighting in their areas.

Coin-Change Company's Exhibit at Birmingham.—In the notice on p. 833 of last week's issue of the exhibit of the Coin-Change Company, Ltd., at the National Gas Exhibition, it was stated that the machine for affixing to meters "consists of a metal tube holding a maximum of 15s. in coppers." This should read 10s.

Loss of Heating Value of Bituminous Coal during Storage.—Dealing with this subject before the Gas and Fuel Section of the American Chemical Society, Messrs. Byrne and Davis stated that previous attempts to measure the loss in heating value of coal during storage have yielded various results, owing to changes in weight of the coal due to oxidation, and owing to the difficulty of obtaining exactly representative samples. The experimental method used by them consisted in accurately weighing duplicate portions of coal (both being of a weight suitable for calorimetric determination) from the same sample, subjecting one portion to oxidation, and immediately determining the heating value of the other. The heating value of the oxidized portion as compared with that of the first was then exactly obtainable, irrespective of any loss or gain in weight during the oxidation process. Loss in heating value varied from 0·02 p.ct. to 0·6 p.ct. for coking coals under various conditions prevailing in the tests.

A Test Laboratory for Manufacturers.—The gas industry is now providing laboratories in various parts of the country in which manufacturers may test the capacity and cost of gas to meet their particular requirements, before they scrap any existing plant. One of the finest laboratories of this kind is to be found at Birmingham; and a description of the valuable service it places at the disposal of local manufacturers is contained in the current issue (No. 115) of "A Thousand-and-One Uses for Gas." This publication also contains many excellent photographs of industrial installations in Birmingham, and gives particulars of the use of gas for brazing brass tubing, heating-up steel parts for case-hardening, hardening small cutting tools, brazing lugs to tubes of cycles and motor cycles, case-hardening and re-heating motor cycle gear parts, annealing gold and silver strip, soldering, &c., in jewellers' workshops, baking enamel on plates, signs, and clock and gauge dials, the heat-treatment of hosiery and latch needles and small steel parts, the heading of glass-headed pins, and the lighting of factories.

THE BRITISH ACETYLENE AND WELDING HANDBOOK.*

This volume, prepared by a Committee of the British Acetylene and Welding Association, is a reference book which will be of the greatest assistance to all engaged in the carbide, acetylene, oxygen, and oxy-acetylene welding industries. Divided into ten sections, the information gathered together on such subjects as dissolved acetylene and its application, the production of oxygen by a large variety of processes, and welding and cutting will be indispensable to a large and appreciative host of readers.

The "Historical Notes" and "Physical and Chemical Notes" by Mr. W. J. Atkinson Butterfield will be found extremely interesting. It is very satisfactory to have this information collated by one who has been so intimately connected with the acetylene industry on its technical side, and who, as joint author with the late Mr. F. H. Leeds of their text-book entitled "Acetylene," has done so much to spread an accurate knowledge concerning this gas. In dealing with the properties of calcium carbide, however, there is no mention made of its combination with nitrogen, with the production of cyanamide; and though admittedly the book is dealing with acetylene production, it is felt that such an important technical property might well have been given. The difficulty of compiling any notes nowadays lies in the large mass of material which has to be condensed into a very limited space; and, while understanding this drawback, some modification of the heading "Calcium Carbide" would, perhaps, have been desirable.

In the useful section on oxygen, by C. Coulson-Smith, the opinion is expressed that the secret of the production of cheap oxygen lies in the adoption of large liquid-air units worked to their full capacity. A comparison is made between a plant producing 500 c.ft. per hour—which may be taken as the smallest practicable unit—and the largest of which the author has adequate personal knowledge—a Claude plant producing 9000 c.ft. per hour. It is stated that, assuming power in each case to cost 1d. per B.H.P., and taking into account labour, material, and a fair proportion of all the usual standing charges, including interest on capital and depreciation, and working the plants continuously to their full capacity, the cost of oxygen produced by the small plant would be 19s., and by the large one 4s. 6d., per 1000 c.ft. It is then stated that if the plants were worked intermittently so as to produce annually only half their full output, the respective costs would tell greatly in favour of the large plant. This seems a remarkable statement when it is remembered that before any production of liquid air can take place a considerable wastage of power is inevitable, and that this wastage is in direct proportion to the size of the plant.

One of the most striking sections is that written by A. Stephenson. This deals in an admirable manner with the subject of dissolved acetylene; many highly interesting points being brought forward. It is suggested that, in view of the intensive developments in the manufacture of synthetic chemicals, and the unique position of acetylene in the hydrocarbon series, together with the fact that by liquefaction acetylene of absolute purity can be produced, sooner or later liquefied acetylene will be a matter of everyday practice in certain manufacturing processes. Calcium carbide, the only commercial source of acetylene, yields a gas containing impurities which are very potent contributory causes to the liability of acetylene to spontaneous dissociation or explosion; but it has been proved that acetone, which has a phenomenally high absorption, has the power of reducing the explosive limit of acetylene. For example, with acetone at 15° C. and 10 atmospheres pressure, and having approximately 260 times its own volume of acetylene in solution, the latter is almost entirely non-explosive. This is due to differential solution. Another important fact stressed in this section is that the heating value and temperature of combustion of acetylene is due to its endothermic nature; the total heating value being due not only to heat of combustion, but also to the augmentation which heat of dissociation provides. If calcium carbide is decomposed when the water is not in excess, polymerization takes place, during which heat of dissociation is lost, or, in other words, "part of the acetylene is converted into other hydrocarbons which are not endothermic, and which have a lower carbon content, and consequently a lower heating and illuminating value. For this reason, though for some purposes the water-to-carbide system may be suitable, there is no doubt that for the manufacture of dissolved acetylene the carbide-to-water type of generator is to be preferred."

Many data are given on the subject of oxy-acetylene cutting which will be of great utility to practical men, who will also appreciate the article by Mr. E. A. Atkins on "Tests on Mild Steel Feed Wire." The acetylene industry will be grateful to the Committee of the British Acetylene and Welding Association for producing such a comprehensive handbook at a most reasonable price—an endeavour which should find its reward in a large circulation.

* "The British Acetylene and Welding Handbook." Prepared by a Committee of the British Acetylene and Welding Association, and published by "The Acetylene and Welding Journal," No. 30, Red Lion Square, Holborn, W.C. 1. Price 7s. 6d. net.

THE INSTITUTION'S EDUCATION SCHEME.

Mr. Walter Hole with the Scottish Juniors.

A joint meeting of the members of the East of Scotland and the Western District branches of the Scottish Junior Gas Association was held on Saturday, Sept. 15, in the Ca'dora Restaurant, Union Street, Glasgow. Mr. Andrew Walker (Kilbarchan), the President of the Western District, was in the chair, and he was supported by Mr. D. D. Bruce (East Wemyss), the President of the Eastern District, Mr. John Murray (Hon. Secretary and Treasurer of the Western District), and Mr. Walter Hole. There was a large attendance of members; and many who are not in the membership of either of the two branches were in attendance, since a general invitation had been extended to all associated with, or interested in, the gas industry.

The CHAIRMAN remarked that considering the brightness of the weather he thought it was most gratifying to see such a representative attendance. It said much for the interest taken in the subject; and it was also a tribute to the personality of the speaker who was to address them with regard to the Institution's new scheme of education. He thought they were all agreed that some such scheme should be inaugurated.

Mr. WALTER HOLE thereafter proceeded with his address, which was on familiar lines, and was a recapitulation of the main features of the scheme. He explained to begin with that the scheme catered for two different classes of students, and the two schemes for these classes ran along parallel lines. In the first place, the scheme provided for students who were in the happy circumstance of living in a place like Glasgow, where there was a technical institute or college which gave instruction in gas subjects. For such a type of student Section I. of the scheme was expressly designed. He supposed in Scotland they knew very well what was meant by a reference to scattered districts—scattered so far as gas undertakings were concerned. There would no doubt be very wide areas in Scotland where students were engaged in works, but were far enough away from any centre which gave instruction in gas subjects. In England there were only eleven institutes throughout the country giving instruction in gas subjects; and there were many areas—provinces he might call them—which were unprovided with instructional facilities of the kind he had in view. From Dover in the east down to Penzance in the west, he believed there was only one institute in the whole of the southern counties. At some length Mr. Hole explained Section II. of the scheme, which he described as supplementary. So far as possible they were desirous of discouraging the supplementary scheme. They wished to encourage the student to avail himself of the co-ordinated courses where possible. If this was not possible, then Section II. could apply. Assuming that the student had proceeded along one or other of the two parallel lines indicated, then his next goal would be to go forward for the Institution's diploma, which would be a certificate of the highest possible character. No student would be eligible to go forward to the diploma examination until he was 23 years of age. On this point there appeared to be much diversity of opinion up and down the country. The diploma, it was well to bear in mind, would be the hall-mark to something more than mere academic attainments. It would attest the holder's practical knowledge of gas production and distribution; and it was absolutely impossible for everyone to have acquired such a grasp of the incidentals and the emergencies which were continually occurring in gas-works unless he had had experience on the practical side covering a reasonable number of years. The diploma would mean that the holder was able to grasp all the ordinary daily routine of a gas undertaking, and was competent to cope with emergencies and difficulties. In connection with the diploma examination, a condition had been introduced that the candidate was to write an original thesis on some aspect of his profession. At the meetings the question had frequently cropped up—what is meant by an original thesis? For instance, in London on Friday, Sept. 7, he was speaking to the London and Southern Juniors, and the question was put to him: Would a paper which had been contributed to a Junior Gas Association be considered as a sufficient qualification under this heading? There was a difficulty here which he thought had to be guarded against. They might have a paper which had been the result of an altogether independent research along particular lines of gas manufacture and gas engineering; on the other hand, there might be a contribution which merely paraphrased some other man's thoughts or works of reference. They must guard against the plagiarist; and they must make certain that the "original thesis" contained original thought and the application of the critical faculties to the subjects under consideration. Section I. of the scheme was the line the student would follow who was attending an institute or college where gas subjects were taught; Section II. was the line the student would follow who could only take subjects cognate to gas at his local institute. Superimposed on these two parallel lines there was the examination for the higher certificate on the diploma of the Institution.

A few questions on points of detail were asked and satisfactorily answered; and at the close a most cordial vote of thanks was passed to Mr. Hole.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Plans of District Mains.

SIR,—In the discussion on the paper on "Light, Heat, and Power," by Mr. J. R. Bradshaw [*ante*, p. 869], I notice that Mr. F. A. West, of Newark, suggests that all gas undertakings should prepare proper plans on a large scale of all gas-mains laid in their district.

It will come as a surprise to many to learn that there are, in fact, scores of undertakings with no such record. All the information in such cases is, as a general rule, contained in the head of some old workman, with whose retirement or death this memorized plan disappears, to be slowly, laboriously, and expensively reconstructed in the head of his successor.

As Mr. West says, the time has surely arrived when all this valuable information should be committed to paper.

G. M. GILL.

119, *Victoria Street, S.W. 1, Sept.* 22, 1923.

Gasification of Coal by the Use of Oxygen.

SIR,—I would like to point out to you a double arithmetical error that has appeared in your paper, and which has far-reaching influence on a great subject which interests us all at the present time. This subject is the gasification of coal by the use of oxygen. The error referred to appears in the June 20, 1923, issue, in the Editorial Notes, in the first column on p. 719, and also in the last half of the first column on p. 739, in the extracts of Mr. T. Campbell Finlayson's paper on "The Economics of Gas Making with Oxygen." This extract is also referred to in your Aug. 22 issue, at the end of p. 576.

It is stated that, with an efficiency of 56 p.ct. for the water-gas plant, and 90 p.ct. for the oxygen plant, the saving of fuel per 100 tons equals 34 tons. It is, however, evident that, with the efficiencies given, the quantity of coal required for producing the same amount of heat in gas in the oxygen plant is 56 divided by 90 × 100, or 62·2 tons. Or the saving is actually 100 *minus* 62·2 tons, or 37·8 tons. It is also stated that the oxygen required per 100 tons of fuel is 1,200,000 c.ft. For the 62·2 tons of coal required in the oxygen plant are, therefore, required 62·2 × 1,200,000 c.ft., or about 746,000 c.ft.

For obtaining equal costs in the two plants, the value of 746,000 c.ft. of oxygen should be equal to 37·8 tons of coal. If one ton of coal is valued at 25s., the value of the oxygen per 1000 c.ft. is 37·8 × 25 divided by 746, equal to 1·265s., or 1s. 3·2d. The value is, therefore, nearly double the value of 8½d. given in your paper. In other words, instead of the oxygen process being unprofitable at the cost of oxygen of 1s. per 1000 c.ft., the process should give a very nice profit at this cost of oxygen.

In order to make my calculation more clearly understood, I have given, in the following table, a comparison between the water gas and oxygen process, wherein the oxygen is valued at 1s. 3·2d. per 1000 c.ft.; and it is seen from this table that, with this price of oxygen, the cost of coal and oxygen, per one ton of coal equivalent of heat in gas, is equal.

For your interest, I am enclosing a copy of my paper on "Gas Producer Practice in Steel Works," which I read before the American Iron and Steel Institute meeting in May of this year. In this paper I have a short paragraph about the use of oxygen in gas producers. In this paragraph I state that the oxygen required for gasification of ordinary bituminous coal, with a fixed carbon content of 57 p.ct., is about half-a-ton of oxygen per ton of coal. The oxygen required for various bituminous coals or coke is approximately in proportion to the fixed carbon content.

Comparison of the Gasification of Bituminous Coal by the Water-Gas Process and the Oxygen-Moisture Process.

—	Water-Gas Process.	Oxygen-Moisture Process.
Coal gasified	100 tons	100 tons
Efficiency of gasification	56 p.ct.	90 p.ct.
Coal equivalent of heat in gas	56 tons	90 tons
Oxygen used—1000 c.ft.	None	1200
Cost of coal—25s. per ton	2500s.	2500s.
Cost of oxygen—1s. 3·2d. = 1·265s. per 1000 c.ft.	None	1520s.
Total cost of coal and oxygen	2500s.	4020s.
Cost of coal and oxygen per 1 ton of coal equivalent of heat in gas	$\frac{2500}{56}$ = 44·6s.	$\frac{4020}{90}$ = 44·6s.

WALDEMAR DYRSSEN.

United States Steel Corporation, No. 71, Broadway, New York, Sept. 6, 1923.

Private Oxygen Plants.

SIR,—Our attention has been drawn to a letter signed by Mr. O. Simonis, Managing Director of Liquid Air, Ltd., published in your issue of the 19th inst. In this letter it is suggested that recent reductions in the price of oxygen are due to competition. That suggestion can be best answered by quoting from a verbatim report of a speech recently made by the Managing Director of this Company at the annual general meeting of shareholders. Referring to the question of prices, he said:

> The average price ruling at March 31, 1923, was 12·5 p.ct. below the average price ruling at March 31, 1922, and it was 20·65 p.ct. below the average price ruling at March 31, 1921. In spite of this reduction in the price of oxygen, the gross receipts from the sales during the year ended March 31, 1923, showed an increase of 9·8 p.ct. as compared with the previous year.

This satisfactory result was due mainly to increased sales of oxygen, which, by enabling plants to be worked more continuously, greatly cheapened the cost of producing the gas. This Company has always given its customers the benefit of reductions in the cost of producing oxygen, and will continue to do so.

Competition has not hitherto affected our output to any discernible extent. Should it do so, the result can, in the end, only be harmful to consumers, as the inevitable consequence of dividing the source of supply of oxygen in any district means greatly enhanced cost of production all round. Experience has demonstrated this fact over and over again—fortunately hitherto less in this country than in others like France and America, where, for this very reason, prices to the consumer are appreciably higher than here. The fact must be obvious to any one really conversant with the liquid-air process, which, by abstracting oxygen from the atmosphere, is provided with an inexhaustible and costless supply of raw material.

I have not read the article in "Industrial Gases" to which Mr. Simonis refers; but there are other fallacies in his letter which that journal will no doubt deal with in due course.

THE BRITISH OXYGEN COMPANY, LTD.
FRANK LEEDS, Secretary.

Angel Road, Upper Edmonton, London, N., Sept, 24, 1923.

SWITCHES FOR GAS.

Copies of the following letters, arising out of a statement by Mr. John Wilson, of Motherwell, in the paper which he read at this month's meeting of the North British Association of Gas Managers, have been forwarded to us for publication.

John Wilson, Esq.,
Town Council Gas Department,
Motherwell.

SIR,—Referring to your paper before the North British Association of Gas Managers, we take strong exception to your remarks: "We have certainly got switches, pneumatic and so on; but they have never passed the stage of being simply makeshifts and gadgets. They were expensive to instal, and finicky to handle, and never by any means met with what could be called universal adoption."

It is to be regretted that such remarks should appear in one of the leading organs of the gas trade (by one who is speaking on behalf of the North British Association of Gas Managers); and we should like to point out that nearly all the leading and progressive gas companies in this country have live accounts with us—particularly the South Metropolitan Gas Company.

This Company have been fighting the electric light to a considerable extent for nearly twenty years; and if you had given us the support that other companies have, it would have been to our mutual advantage, and the trade in general. Anybody can condemn a system.

We have taken Stand No. 2 at the National Gas Exhibition, Bingley Hall, Birmingham, which opens on Monday, Sept. 17, and which will be attended by all the leading gas engineers in the country. If you will advise me on which day you will be present, I shall be most happy to disabuse your mind.

Yours faithfully,
(signed) NEVILLE EDWARDS,
Pneumatic Gas Lighting Co., Ltd.

36, *Farringdon Road, E.C. Sept.* 15, 1923.

Neville Edwards, Esq.

SIR,—Your communication of the 15th inst. to hand, *re* certain statements which I made to (and not, as you have it, on behalf of) the North British Association of Gas Managers—the views expressed being my own. If the statements which you have called in question were wrong, it is unfortunate that someone in the meeting did not bring this out in the discussion.

Far from being prejudiced against pneumatic switches, I am strongly in favour of them, and have fitted them in my district. My own house, including gas-fires, is fitted-up on these lines. But they do require a certain amount of special knowledge and attention, which the present-day gas-consuming public is not prepared to give.

The pneumatic method of operating gas switches is, to my mind, the best that we have for domestic purposes, and is a very effective means of control; but my point was that we have not as yet a standard control incorporated with the fitting, such as the electricians have.

I note also that, though you have taken exception to my remarks, you have not refuted them; nor have you said anything in your letter which would warrant me changing my opinion.

Yours faithfully,
(signed) JOHN WILSON,
Engineer and Manager.

Corporation Gas Department, Motherwell, Sept. 17, 1923.

The "F.B.I." and Empire Trade.—The "F.B.I." (Federation of British Industries) have been actively engaged for some time in examining the question of inter-imperial trade. The labour involved during this investigation, in collecting and collating economic information about the Empire, and particularly as to its resources and requirements in raw material, led the Federation to believe that a comprehensive survey in a form convenient for easy reference by the ordinary business man would be of very substantial value in promoting the development of Empire trade. They have therefore undertaken the compilation of a comprehensive survey of the resources and possibilities of the Empire. The idea is to collect all available information likely to be of service to the producer of raw materials, the manufacturer, the merchant, or the financial house—in fact, to compile a convenient encyclopædia of Imperial trade. The survey will be included in several volumes.

REGISTER OF PATENTS.

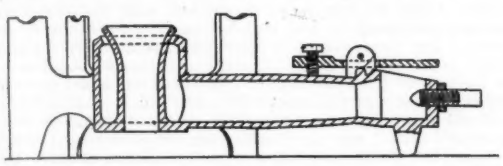
Gas-Burners.—No. 202,099.

FLAVEL, P. W., of Leamington.

No. 15,843; June 7, 1922.

This invention relates to gas-burners for use especially with boiling rings, but which may also be employed for other purposes, such as fires and radiators. It seeks to render such burners more efficient.

As will be understood from the vertical section through the appliance, which we reproduce, a nipple supplies gas to a tube leading to an annular space surrounding a central air duct. The wall of the annular space is cast in one with the air duct; and the channel between the wall and the duct forms an annular discharge nozzle. The sides of the channel are preferably machined, in order to provide a smooth aperture and consequent steady flame. The upper edge of the duct extends beyond the upper edge of the wall, thereby preventing the inward deflection of the flame when a vessel is placed on the burner.



A Flavel Boiling-Ring.

Above the gas-nipple is an aperture for the admission of primary air. The size of this aperture is controlled by a pivoted plate, the position of which is regulated by a screw. When it is desired to light or extinguish the burner, this plate is depressed so as to close the aperture; thereby causing the mixture to the burner to be non-explosive, so that the lighting or extinguishing is not attended with flashing or noise.

The mixture supply-pipe is preferably led in to the nozzle plant tangentially; better admixture being thus secured.

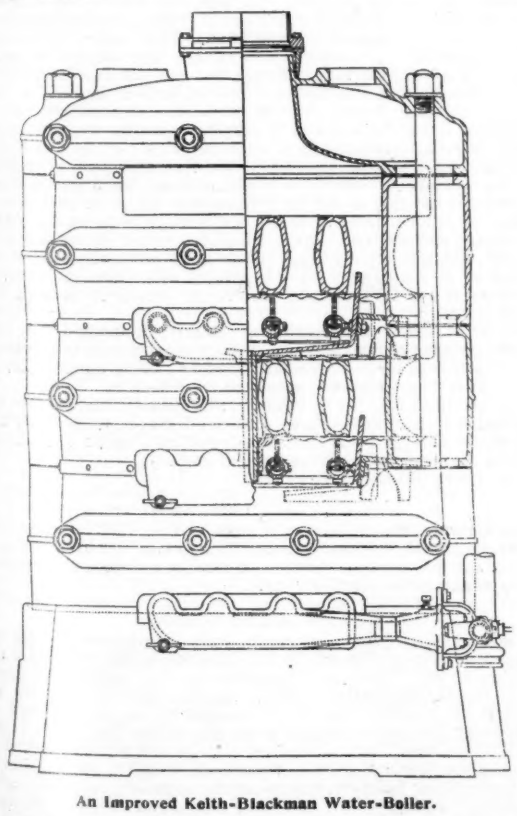
The means described for regulating the amount of secondary air passing to the burner is the subject of a concurrent patent application No. 10,009 of 1923, and forms no part of the present invention.

Gas-Heated Water-Boiler.—No. 202,095.

KEITH, J., & BLACKMAN CO., LTD., and KEITH, G., both of Farringdon Avenue, E.C. 4.

No. 15,555; June 2, 1922.

According to this invention, which relates to gas-heated water-boilers comprising independently heated superposed tubular sections, trays are arranged beneath the tiers of burners to prevent the products from the lower burners interfering with the operation of burners at a higher level.



An Improved Keith-Blackman Water-Boiler.

We reproduce a part elevation part vertical section of a boiler according to the invention, which shows that the main heating portion of the boiler consists of superposed horizontal sections surmounted by a dome and having water-ways joined at the sides only. Cross tubes extend from front to back of the boiler; and tubular burners are arranged so that the flames impinge on the tubes for their entire length. The burners are preferably split longitudinally so as to present an elongated outlet slot in which are fitted two corrugated metal strips separated by a plane strip, so that, even with a high-intensity flame, there is no risk of lighting-back when the gas supply is reduced.

As the burners are thus in tiers at different levels, ordinarily the products of combustion rising from the lower burners would interfere with the operation of burners at a higher level. To obviate this, below each set of burners is provided a tray having turned-up ends, the back and front of which fit fume-tightly the sides of the relative section.

To prevent the induction of an excessive amount of secondary air, an adjustable side plate is attached to each tray, projecting in such wise as to choke the outlet from the burner system below. For instance, the side plate fitted to the lower tray may be adjusted to leave between its outer edge and the wall a space just sufficient to take a little more than the products of combustion rising from the lowest system of burners. The plate fitted to the tray above is adjusted to leave a clearance of twice this width, and so on. Thus the draught through each section is controlled independently of the draught through the remaining sections, and independently of the chimney draught. The secondary-air required is drawn-in partly from the front through air spaces round the injectors, and partly from the back through the small spaces between the sections. The burners are fed by a common gas supply pipe; each set being separately controlled by a cock.

For dealing with water of condensation, on the bottom of each cross tube are two rows of dripping pips so disposed as to clear the burner openings. These pips are preferably constituted by a corrugated rib with vertical corrugations. The trays receive the condensed products, and drain to a tube, central or otherwise. Doors are provided by means of which the tubes of the water-ways may be cleaned from the front; while side doors permit convenient cleaning of the back portions of the sections.

Gas-Burners.—No. 202,449.

SMITH, J. & W. B., LTD., and WATKINSON, F., both of Farringdon Road, E.C.

No. 16,175; June 10, 1922.

This invention relates to inverted incandescent gas-burners of the general type having a mixing tube in which is provided a bulbed or egg-shaped mixing chamber, which is divided across the enlarged part into two parts adapted to unscrew so as to allow of the insertion, cleaning, or replacement of a wire-gauze diaphragm or like device; the lower part forming the burner nozzle and carrying a mantle, and the upper part being secured to a metal supply pipe which carries the heat deflecting baffle and apparatus for securing the globe.

According to the invention, both parts of the egg-shaped mixing chamber are formed of ceramic ware; and the upper part is preferably provided with longitudinal strengthening ribs.

Such a construction, it is claimed, obviates the liability of the nozzle and mantle dropping out when the burner becomes hot; and further, the fireclay mixing tube or body preheats the gaseous mixture to a greater extent than a metal body, thereby increasing the efficiency.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Sept. 12.]

Nos. 22,093 to 22,645.

DAVIES, W. E.—"Apparatus for heat treatment of coal." No. 22,410.
GRANT, C. DE V.—"Gas-ovens." No. 22,335.
LYNCH, H. L.—"Gas-burners." No. 22,415.
MADELEY, C.—"Gas meters." No. 22,587.
PARIS, W. S.—"Gas-economizer for gas-stoves." No. 22,645.
SIMPSON, S.—"Gas-cocks." No. 22,257.
WATSON, A. C.—"Gas-ovens." No. 22,400.

[Extracted from the "Official Journal" for Sept. 19.]

Nos. 22,646 to 23,180.

CLARK, H. C.—"Hot-plates." No. 22,980.
ELLER, K. B. E.—"Treatment of peat, and production of gas and bye-products therefrom." No. 23,091.
HELPS, G.—"Gas cookers and ovens." No. 22,673.
HORSNAILL, H. F.—"Incandescent gas-burners, &c." No. 22,956.
JOBIN, M. L. A.—"Instrument group for observation of illuminants, absorption, and diffusion." No. 22,773.
KAHL, L.—"Distillation of tars." No. 23,096.
KOPPERS COMPANY.—"Regeneratively-heated retort-oven batteries." No. 22,704.
KOPPERS COMPANY.—"Coking retort-oven batteries." No. 22,805.
KOPPERS COMPANY.—"Apparatus for purifying gases." No. 23,002.
LYNCH, H. L.—"Gas-burner." No. 23,122.
MITCHELL, J.—"Saturators for gas plant." No. 23,119.
NORDBERG, B. V.—"Air or gas compressors." No. 22,702.
OLIVIER, G. P.—"Gas-stoves, &c." No. 22,883.
RÜTGERSWERKE AKT.-GES.—See Kahl, L. No. 23,096.
STEWART, J. G.—"Means for regulating gas flow to gas-calorimeters." No. 23,036.
STEWART, J. G.—"Means for maintaining constant temperature in gas-heated apparatus." No. 23,037.
WEST'S GAS IMPROVEMENT COMPANY.—"Valves." No. 22,828.
YVON, G. G. J.—See Jobin, M. L. A. No. 22,773.

A reduction of 1s. 8d. per 1000 c.ft. of gas in Ballinasloe leaves the charge at 10s. per 1000 c.ft.

MISCELLANEOUS NEWS.

ALLOA CORPORATION GAS DEPARTMENT.

Gas Consumers to Pay for Electricity Deficit.

At a recent meeting of the Alloa Town Council, the Convener of the Gas Committee (Councillor Duncanson) presented the accounts and statistics of working for the past year. The gas made amounted to 206,292,800 c.ft., and the coal carbonized to 10,944 tons; the make per ton being 18,850 c.ft. of an average calorific value of 455 B.Th.U. Residuals produced were as follows: Coke saleable, 10·87 cwt.; tar made, 17·87 gallons; and sulphate of ammonia, 34·35 lbs.—all per ton of coal carbonized. The average price paid for coal was 22s. per ton. The average price received for coke was 23s. 9d. per ton, and for tar 37s. 8d. per 100 gallons. The total income from the sale of gas, residuals, &c., amounted to £38,186, and the expenditure for coal, wages, repairs to works, pipes, meters, cookers, taxes, &c., was £26,986, leaving a gross profit of £11,200. Interest, sinking fund, and bad debts absorbed £6462, leaving a net surplus of £4738. The practical and financial results were considered most satisfactory.

Dealing with the estimates for next year, and taking into account an extra rate of 4s. per ton for coal, the gross profit would amount to £11,182, or a net profit, after meeting capital charges, of £3880. This result would permit of a reduction in the price of gas. It was explained, however, that, in view of the accumulated deficit of £32,446 incurred in the working of the electricity department during the past four years, it was proposed to increase the price by 7d. per 1000 c.ft. This would yield about £6000 per annum, and would be a beginning towards liquidating the losses of the electricity department. It is estimated that a loss of £3000 on the working of this department will result for the current year; and it is expected that the increased rate of 7d. to be paid by consumers of gas will continue for a period of at least seven years. The subject of the financial condition of the Alloa Electricity Department had been before the Electricity Commissioners and the Scottish Office, who had approved of the course now taken—viz., that the losses be met from the gas revenues. The Council confirmed the increase in price from 2s. 11d. to 3s. 6d. per 1000 c.ft.

The authority given to town councils in Scotland to make use of gas-works profits to meet electricity losses is found in the Electric Lighting (Scotland) Act, 1890, as set forth in the schedule annexed thereto. This Act extends to Scotland only. The case of Alloa is a particular hardship, as in years past the sum of £9300 has been paid to meet electricity deficits, and a further sum of about £40,000 will require to be met during the next few years. The Electric Lighting Act of 1890, besides being out of date having regard to progress and change, is entirely out of sympathy with what is fair and equitable as regards placing the burden upon the proper shoulders. Consumers of electricity may use only a relatively small quantity of gas, and are therefore almost freed from the financial losses arising out of the working of the electricity supply created to meet their demands. They enjoy lower rates for power and lighting, due to a direct tax of 7d. per 1000 c.ft. imposed upon the users of gas—and particularly the working classes, who, through slot meters, account for fully 50 p.ct. of the total quantity of gas sold. That is to say, the large power users of electricity and users of electric light in shops and villas, are enjoying lower rates at the expense of consumers of gas who themselves do not require electricity. Consumers of gas should not be specially chosen to alone meet the regrettable adverse results of municipal electricity trading, they being only one section of the community. The burden should be placed as equally as possible upon all classes.

The financial chaos into which the Alloa Corporation electricity supply has been allowed to get is due in part to bad trade; but it is also largely due to an inflated capital account for an undertaking of that size. This has arisen because of extravagant expenditure in the purchase and erection of second-hand steam plant. The capital account has been increased by almost three times that of 1919; while the rates charged to consumers of power are 188 p.ct. more than in that year, and for lighting the price is now 8d. per unit, being the maximum rate allowed. Despite the excessive rates charged, a financial loss of £3014 resulted. For the current year the Council have decided to reduce the power rate by 15 p.ct.—and this entirely with the object of preventing a decreased consumption of current, because of large power users threatening to put down their own generating plant.

Reduction at Morecambe.—The Borough of Morecambe Gas Department have decided to reduce the price of gas, as from the next reading of the consumers' meters, by 1½d. per therm, which is equivalent to a reduction of 6d. per 1000 c.ft.

Welshpool Gas Company and Electricity Supply.—The annual meeting of the Welshpool Gas Company was held on Sept. 13, Dr. R. D. Thomas, the Vice-Chairman presiding. The Directors, in their report, stated that there was a balance in hand of £717. Out of this they recommended a dividend of 6 p.ct. (subject to tax). In proposing the adoption of the report and accounts, the Chairman said that a reduction in the price of gas of 10d. per 1000 c.ft. was made in October; and a further reduction of 5d. would come into force next October. Six months ago the Company had applied to the Welshpool Corporation for their support to obtaining the necessary authority from the Electricity Commissioners to supply electricity in the borough. The Corporation had considered the matter; and it was still under discussion. Mr. H. E. Harrison, commenting upon this, said he was surprised that they had not been met by the Corporation in a co-operative spirit; for if electricity was desired, and a public body came forward to provide it, an opportunity should be given to it. They could, if they wished, make application to the Commissioners for an Order without the consent of the Corporation; but as this course would involve all concerned in heavy costs, he was hopeful that they would be given the consent. The report was adopted.

VALUATION OF GAS UNDERTAKINGS.

Satisfactory Adjustments in Scotland.

Wednesday of last week was a satisfactory one for many gas undertakings in Scotland. Early expectations gave the impression that the day would be one of protracted argument, legal debate, and evidence, because it had been assigned as a diet for proof in appeals lodged by a number of gas companies and corporations against the valuations proposed to be placed upon them by the District Assessors in Dumbartonshire and Lanarkshire. In all the instances, the County Buildings in the City of Glasgow had been fixed as the venue for hearing the appeals.

KIRKINTILLOCH.

The Valuation Appeal Court for the Eastern District of Dumbartonshire dealt first of all with an appeal on behalf of the Kirkintilloch Town Council against the valuation of the gas-works at £3069—the figure suggested by the Town Council being £1453. The Town Council of Kirkintilloch were represented by Mr. E. Howard Collins, a London expert on gas-works valuations, who said that since the appeal was continued, he had met the Assessor; and the result was the time of the Court would be materially saved. Mr. Dalgish (the Assessor) would tell the Court the settlement that had been reached.

Mr. Dalgish said the valuation of gas-works was based on what was known as the revenue principle. This was the method adopted with all undertakings possessing a monopoly or quasi-monopoly—revenue being treated as rent, and ascertained from the accounts in the ordinary way. But there had been grafted on to the system, in order to arrive more accurately at annual value, what was known as a "hypothetical tenant," who was entitled to a deduction from the excess of revenue over expenditure of (1) a sum for what was called floating capital, and (2) interest on the value of tenant's chattels, which an intending tenant was assumed to possess. When the undertaking was conducted by a gas company, a further allowance was made, before arriving at the value, for tenant's profits. The last consideration was not applicable where the undertaking was non-profit-earning—such as was the case with the Kirkintilloch Town Council, who, as Gas Commissioners, were restricted by Statute. In arriving at the annual value for the valuation roll, the question of the value to be placed on tenant's chattels was raised on behalf of the Kirkintilloch Gas Commissioners; and elaborate valuations were prepared of all meters and cooking-stoves in the possession of the undertaking. As these values were far beyond any figures disclosed in the audited accounts, the question at issue was mainly how far such valuations could be accepted (if at all) in the case of these gas-works. Having been since satisfied with the substantial accuracy of the valuations (although it was admitted that the enormous discrepancy was due in great part to charging additions to revenue), he would not feel justified, as would appear at first sight, in rejecting this valuation, especially as the principle had not been opposed in 1914, when the valuation by the Manager at the time, which differed from the valuation in the accounts, was accepted as regarded meters. Accordingly, he obtained from Mr. Collins, and added back to the surplus of revenue over expenditure for each of the years forming the averages 1920, 1921, 1922, the cost of the additions to meters and cooking-stoves. He was thus enabled to accept the valuation adjusted to May in each year. The next question concerned the allowance for cash in the bank, as the Town Council had borrowed on bank overdraft. Keeping in view the hypothetical tenant, he allowed a portion of the overdraft, but not the overdraft interest. With this question was involved that of rate of interest on these tenant's chattels. The Town Council borrow very cheaply from the Municipal Bank; but he was of opinion that that was not sufficient reason for withholding the usual allowance of 6 p.ct. on this class of capital. When they borrowed from the National Bank of Scotland, the rate was 5½ p.ct., and as he had ascertained that 6 p.ct. had been conceded in the case of the gas companies in the other district of the county, he did not desire to create a difference between one part of the county and another. There were also minor points—allowance for coal, and the like—with which he need not trouble the Court. The effect of the adjustment was that, if the Court approved, the valuation of the Kirkintilloch Gas-Works would be reduced from £3069 to £2675.

Mr. R. A. Munro (a member of the Court): It seems a very large assessment upon a small works. There does not appear to be any way of getting behind the Government system of valuing these works; but it does seem a very high assessment on the face of it.

The Chairman (Mr. A. E. Wallace): Somebody must pay the tax. I am advised that the Assessor conducted the negotiations quite in accordance with the cases already adjusted, so I would move that we agree to the reduction of the assessment to £2675.

This was agreed to.

VALE OF LEVEN AND RENTON.

Appeals were also adjusted in respect of the Vale of Leven Gas-Works, on the roll at £4429, and the Renton Gas-Works in the same area, on the roll at £894. In the one case the valuation was restricted to £3751, and in the other to £718.

CARLUKE AND STRATHAVEN.

It was anticipated that the appeals from Lanarkshire fixed for the County Buildings in Glasgow on the same day would monopolize the attention of the Valuation Committees for the Middle and Upper Wards for a considerable period. Appeals were put forward on behalf of the Carluke Gas-Works, situated in the Upper Ward of Lanarkshire, and with reference to the Strathaven Gas-Works, in the Middle Ward area. Mr. E. Howard Collins was also in attendance here, and was prepared to lead evidence on behalf of the appellants. His intervention, however, was not found necessary, except in carrying through adjustments which were considered mutually satisfactory to all concerned. The Carluke gas undertaking was adjusted at a figure of £1700 by way of assessable rental, while a compromise was also found possible in regard to Strathaven. The Assessor's original figure for Carluke was £1837, and for Strathaven £447.

GAS REGULATION ACT APPLICATIONS.

The following further notices have appeared in the "London Gazette" with regard to applications to the Board of Trade for Orders under the Gas Regulation Act.

Festiniog Urban District Council.

The maximum price now authorized in respect of the supply of gas by the undertakers is 5s. 6d. per 1000 c.ft ; and the price they have asked the Board of Trade to substitute for this is 1s. 9·33d. per therm.

It is also proposed that an additional charge of 1d. per therm should be authorized in respect of gas supplied through a prepayment meter.

SPECIAL ORDERS.

Freshwater Gas Company, Ltd.

Notice is given by the Company of their intention to apply to the Board of Trade for a Special Order under section 10 to extend their limits of supply so as to include the parishes of Yarmouth, Thorley, and Shalfleet, in the rural district of the Isle of Wight; to enable them to purchase additional lands; to increase their borrowing powers; and to regulate the supply of gas.

Gosport Gas and Coke Company.

Application is to be made by the Company for a Special Order to provide for the transfer to them of the undertaking of the Fareham Gas and Coke Company; to make provisions as to the price to be charged for gas supplied in the Fareham Company's area; to enable the Company to use scheduled lands for gas-works purposes; to establish co-partnership; and to regulate the supply of gas.

DECLARATIONS OF CALORIFIC POWER.

Boston Gas Light and Coke Company.—460 B.Th.U. (Nov. 1)

Harrow and Stanmore Gas Company.—500 B.Th.U., in substitution for 450 B.Th.U. (Dec. 21.)

Honley Urban District Council.—500 B.Th.U. (Oct. 1.)

Melton Mowbray Gas Light and Coke Company, Ltd.—500 B.Th.U. (Sept. 29.)

Morley Corporation.—475 B.Th.U. (Sept. 17.)

Richmond Gas Company.—500 B.Th.U., in substitution for 460 B.Th.U. (Dec. 27)

Weston-super-Mare Gas Light Company.—475 B.Th.U., in substitution for 450 B.Th.U. (Jan. 1, 1924.)

ALLIANCE AND DUBLIN CONSUMERS' GAS COMPANY.

Report and Accounts.

The report of the Directors of this Company for the half-year ended June 30, states that the accounts show a profit on the revenue account of £56,565; and after providing for interest on debenture stock and income-tax, there remains £48,962, to which must be added the sum of £11,172, being the balance brought from last account, and a credit for interest amounting to £164, making a total of £60,298. Out of this total, the Directors recommend the payment of a dividend at the rate of 5½ p.ct. per annum (less income-tax) on the consolidated ordinary stock of the Company, which will absorb £42,676, and an appropriation of £5819 to the reserve fund, making in all the sum of £48,495, leaving a balance of £11,802 to be carried to next account.

Statements appended to the report show, in regard to coal, there was in store at December last 21,145 tons; received during the half-year, 44,960 tons; carbonized during the half-year, 47,593 tons; used and sold, 174 tons; and in store on June 30, 18,338 tons. Of common oil there was in store on Dec. 31, 355,988 gallons; received during the half-year, 253,507 gallons; used or sold during the half-year, 266,913 gallons; and in store on June 30, 342,582 gallons. As to residual products, there were in store on Dec. 31, 740 tons of coke; made during half-year, 31,407 tons; used in manufacture, 9890 tons; sold, 20,727 tons; and in store on June 30, 1530 tons. Of breeze there were in store in December 250 tons; made during the half-year 5063 tons; used in manufacture, 4397 tons; sold, 796 tons; and in store on June 30, 130 tons. Tar had 158,932 gallons in store in December; made during the half-year, 591,770 gallons; used in manufacture, 494,882 gallons; and in store on June 30, 255,820 gallons. Ammoniacal liquor is represented by 181,878 gallons in store at December; made during the half-year, 1,128,000 gallons; used in manufacture 1,113,884 gallons; and in store on June 30, 195,994 gallons. A statement on gas shows: Made, common, at declared calorific value (including 801,396 therms carburetted water gas), 3,974.512 therms; public lighting, 128,774 therms; private lights per meter, 3 317,144 therms—total quantity sold, 3,445,918 therms; used at the gas-works, 68,391 therms; total quantity accounted for, 3,514,309 therms; unaccounted-for, 460,203 therms; number of public lights, 4382. Of common gas at observed calorific value there were made 4,385,345 therms; and sold 3,802,112 therms.

Northern Ireland Coal Development.—The Northern Ireland Government's Industrial Commission visited Coalisland, Co. Tyrone, recently, and inspected the new collieries now owned by Sir Samuel Kelly, of Belfast, which are expected to produce 100,000 tons per annum over an estimated life of forty years. It is thought possible that the tonnage existing between the site of these collieries and the shores of Lough Neagh amounts to 200,000,000. The basin may be found later to extend under the Lough, though probably at a very considerable depth. The coal is bituminous, and is comparable with the better-class Scotch coal. By next spring some 400 men will be employed under ground. The shafts are sunk to a depth of 1000 ft. The party were conducted by Viscount Charlemont, Chairman of the Commission, and Sir S. Kelly.

METROPOLITAN GAS COMPANY OF MELBOURNE.

Half-Yearly Meeting.

The Half-Yearly Meeting of the Company was held on Friday, July 27, in Melbourne—Sir JOHN M. HIGGINS (the Vice-Chairman) presiding, in the absence through indisposition of Sir John Grice.

The SECRETARY (Mr. A. E. Bradshaw) read the notice convening the meeting; and the Directors' report and the balance-sheet for the six months ended June 30 were taken as read.

The CHAIRMAN, before proceeding to move the adoption of the report and accounts, referred to the loss the Company had sustained by the death of the Manager and Secretary, Mr. John Hinde, who had served the Company well for a period of 23 years. The Directors had the highest regard, respect, and esteem for his sterling personal qualities, as well as for that marked executive ability and keen business knowledge which he at all times displayed in the performance of his responsible duties. Mr. A. E. Bradshaw, who had had twenty years' experience with the Company, had been appointed Secretary. The profits for the half-year under review amounted to £58,679, to which had to be added a refund of £23 545 received from the Federal Commission of Taxation. From the total sum of £82,224, a transfer of £15,000 had been made to the reserve fund, and £2224 was added to the carry forward. The revenue from gas showed a falling off, in consequence of the price having been reduced from 6s. 8d. to 6s. per 1000 c ft. The output, however, at 1921 million c.ft., was 3·28 p.ct. above the corresponding half of last year. The No. 4 section of the Woodall-Duckham carbonizing plant at the West Melbourne Works, now in course of construction, was expected to be ready for operation by the end of this year; and foundations were being installed at the same station for the erection of two additional carbonizing plants, which would be needed in the near future. A new gasholder of 2¾ million c.ft. capacity had been erected at Fitzroy. Electric welding had been employed on holder work with very satisfactory results. The past six months had been a very strenuous time for the manufacturing departments of the Company. At no time in the history of the undertaking had the demand for gas been so insistent, or the resources of the Company so greatly strained—a miners' strike having interfered with the supply of suitable coal. The length of the Company's mains was greatly in excess of that in the large towns of England; and the unaccounted-for gas was remarkably low. The leakage of electric current from the railways and tramways continued to give the officials much cause for anxiety. The future of the Company depended upon the immediate selection of a new site additional to the existing stations.

The report and accounts were adopted; and a dividend of 6s. 6d. per share was declared for the half-year.

NEW GAS-WORKS FOR BURNLEY.

The Burnley Corporation Gas Committee have decided to proceed with the erection of new gas-works, on the lines suggested by their Engineer (Mr. J. P. Leather) in a report.

In this report, Mr. Leather states he emphasized in November, 1921, the desirability of proceeding as early as possible with new works at Old Hall. Increased gasholder capacity was needed then; and the necessity for additional manufacturing plant would soon become urgent. The gasholder was now in course of erection, and would be available early in 1924. He further stated that plant could be erected on the new site capable of producing gas with an economy, compared with present methods, of 6d. per 1000 c.ft.; and, in addition, great savings would be effected, by connection to the railway, in the cost of carriage of coal, residuals, and other materials. Altogether he estimates a saving of at least £18,000 per annum with a plant of a capacity of 2,000,000 c.ft. (9500 therms) per day. The cost of a complete plant would not be more than £200,000; and this would include quite a number of items for buildings—such as boiler-house, exhauster-house, mechanics' shops, &c.—which would suffice when the works were subsequently extended to manufacture more than double the quantity of gas. It would not be possible to commence making gas with the new plant before the end of 1925; but by the time the plant was completed, it would have become absolutely necessary. The present capacity of the carbonizing plant was: Inclined retorts, 2,000,000 c.ft. per day; vertical retorts, 1,000,000 c.ft.; and carburetted water gas, 1,500,000 c.ft.—a total of 4,500,000 c.ft. per day. This figure supposed everything in the best condition; and an allowance should be made in practical working of 25 p.ct., thus reducing the reliable capacity to 3,375,000 c.ft. per day, an amount that was regularly exceeded (in consumption) in November, December, and January, even with the depressed condition of trades during the past two years. In order to facilitate the work of erection of the plant, he suggested that an early start should be made with the laying of the necessary drains and the making of the permanent road through the centre of the works. This would render the subsequent operations easier, and could be proceeded with while the detail drawings and specifications were being prepared. The cost of the preliminary work would be £4950.

Mr. Leather also reported upon a scheme for conserving heat which, under present boiler conditions, was wasted. This provided for the installation of a special type of boiler at a cost of £2548; and it was pointed out that there would be a saving of £1051 annually, which would repay the cost of the installation in about 2½ years. The report was accepted, as also was a tender received for £2153.

The Executors of J. Hargreaves, colliery proprietors, informed the Committee that they proposed erecting new coke-ovens, and would be prepared to sell the gas produced to the Corporation. The Vice-Chairman of the Committee announced, after an interview with the firm's Manager, that the proposal would not justify the Corporation deferring their proposal to erect new gas-works.

HARPENDEN PUBLIC LIGHTING.

An Electricity Chairman's Surprise and Regret.

The decision of the Harpenden (Herts) District Council to light their district with gas during the coming winter has surprised Sir James Devonshire, the Chairman and Managing-Director of the North Metropolitan Electric Power Supply Company, Ltd. At a recent meeting of the Council, a letter was read from Sir James stating at considerable length the Company's views on the procedure of the Council in not inviting his Company to tender in competition with the Harpenden Gas Company for the new street lighting contract. "Surprise and regret" at this circumstance was expressed by him. The Chairman (Mr. C. J. Williams) said that apparently the Electricity Company felt rather aggrieved that the Council did not entertain the lighting of the streets by electricity; but, as members knew, the Lighting Committee went very thoroughly into the matter as to whether it was advisable to light the outlying parts of the district by gas, and the rest of Harpenden by electricity. Mr. R. G. Harding (Chairman of the Lighting Committee) said the Surveyor reported that the public lighting season commenced on Aug. 15. There were 243 lamps now alight from half-an-hour after sunset until 11 p.m., with four extra lamps in important positions burning until 1 a.m. The lighting area was about two square miles, and contained nearly twenty miles of roads. The report added that "110 lamps in ten miles of roads are outside the present electric lighting area." Mr. Harding said it was very doubtful whether electricity for street lighting was as good as gas. It was a debatable question. But apart from this, there were ten miles of roads where the Electricity Company could not supply light; and the Council would have to go to the Gas Company for the remainder—practically half. The result inevitably would have been that the Council would have had to pay a higher price for gas lighting, whereas they had now got a contract at a low figure for the whole area. In view of the fact that the Electricity Company could not supply the whole of the district, he considered the Council acted rightly in closing with the very favourable contract offered them by the Gas Company. Mr. C. W. Latter asked whether it was not also the fact that all the gas-standards belonged to the Company. The Chairman said they did; and the Council would have had to buy electric light standards. He added that, when the gas contract expired (in five years' time), the electricity system would perhaps cover a more extended area; and the subject could then be further considered.

DUNFERMLINE GAS-WORKS REPORT.

In his report upon the working of the Dunfermline Corporation Gas Department for the year ended May 15, Mr. James Campbell (the Engineer and Manager) states that the expenditure on revenue account amounted to £44,738, and the income to £61,832, giving a gross profit of £17,094, or with the sum brought forward a total of £17,703. Deducting interest, sinking fund, &c., and £500 added to the retort repairs fund, leaves a balance of £3497 to be carried forward.

The coal carbonized was 17,816 tons, the average cost of which was 20s. 2¾d. per ton. The quantity of gas made during the year was 310,854,000 c.ft., an increase of 35,214,000 c.ft., equal to 12·77 p.ct. The average yield of gas per ton of coal over the year amounted to 17,448 c.ft., of an average calorific value of 437·23 B.Th.U., equal to a production of 76·28 therms per ton of coal, compared with 73·33 therms per ton in the previous year. The wages paid on revenue account during the year totalled 7·66d. per 1000 c.ft. of gas made, as against 9·12d. in 1922, and 13·37d. in 1921. The net income from residual products equalled 17s. 1d. per ton of coal carbonized, or 84·5 p.ct. of the cost.

The vertical retort installation has now been in use for three years, and continues to give the utmost satisfaction. The yield of gas per ton of coal shows a progressive increase, and the labour costs are very low; while the maintenance charges so far have been almost negligible. A new holder of 1¼ million c.ft. capacity is now completed.

The price of gas was reduced from December last from 3s. 2d. to 2s. 10d., and again in March from 2s. 10d. to 2s. 8d. per 1000 c.ft. to ordinary consumers, with power and industrial rates from 2s. to 1s. 8d., according to scale. This rate of 2s. 8d. compares with 2s. 3d. in 1914, an increase of only 18·5 p.ct., while coal and wages are still 100 p.ct. up compared with that date.

Further Reduction at Swadlincote.—The Swadlincote District Council propose further reductions in the price of gas as from Oct. 1 next. The prices recommended are: Up to 100,000 c.ft. per annum, 1s. 2½d. per therm inside the district, and 1s. 5d. outside. Over 100,000 up to 200,000 c.ft., 1s. 1¾d. and 1s. 4¾d. Over 200,000 c.ft., 1s. 0½d. and 1s. 3d. It was also decided to recommend that the present differentiation between ordinary and slot-meter charges (apart from free fittings) be discontinued, in order to encourage the use of gas for household purposes.

A Defective Gas-Tap.—Last Saturday week an inquest was held on a servant who was found lying dead on the floor of her bedroom in the Mason's Arms Hotel, Burnley; the discovery having been made by the licensee through a strong smell of gas. Answering the Coroner, the licensee said the gas-tap was defective. There was no stop to the tap, which could slip round, and allow gas to escape. He was not previously aware of the defect. Mr. A. H. Clegg, the Deputy Gas Manager, said the bracket ought not to have been allowed to remain as it was for a single night, as it was impossible to use it at all without a considerable quantity of gas escaping. He stated that in all cases of gas poisoning the patient ought to be taken immediately into the fresh air, and an oxygen apparatus requisitioned. The apparatus would be sent to any responsible person who asked for it. He hoped the public would bear this in mind, as it was essential to administer oxygen at the earliest possible moment in such cases. A verdict of "Death from misadventure" was returned.

THE NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

The market has passed through another dull and lifeless week. Demand seems to be at a very low ebb again, and new business, either for prompt or for forward, entirely lacking. Inquiry from Germany seems to have stopped altogether—perhaps a sign that they have reached a point where they can no longer offer sterling against shipment.

In spite of the lack of inquiry, however, the market has shown no signs of breaking. The volume of business already placed for the remainder of the year is, apparently, proving sufficient so far to keep the collieries working full time. Another sign of the volume of shipment passing has been serious congestion at the shipping places. Loading turns all round have been exceptionally slow. In some few cases where collieries have had tonnage waiting for which no berth was available, they have had to sell odd lots at below market rate to keep going. But, except for instances of this kind, best-quality gas makes are pretty well sold out for the remainder of this year, and quote firmly at 24s. for all positions, including next year. Seconds quote about 22s. 6d. Collieries might be inclined to consider serious business over a period at slightly below these figures; but, as stated above, buyers are holding-off completely at present.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From a Local Correspondent.

Gas coal in Yorkshire and Lancashire is firm, and as corporation bodies and public utility works generally are using more, there is no lack of orders for this description of fuel. Public utility works as a whole are using more coal, and there is a slight stiffening of the slack smalls used in electricity works.

There is a much better demand for the best grades of large coal, and prices are likely to advance when the colder weather comes. The secondary descriptions are moving quite freely; and they are also likely to advance to a slight extent during the next few weeks.

Shipping appears to be somewhat on the improvement in regard to the demand; but prices remain low, possibly on account of the exchange.

Industries generally do not appear to be improving; the textiles being rather dormant. There are one or two encouraging features, however, which may lead to increase in business. For example, there are more inquiries from the iron and steel industries.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

There is little material price variation in the Midlands. Gas coal is being moved more freely now that we have reverted to solar time. The stimulus which has been given to the demand for lighting supplies is not accompanied by any improvement in the consumption of industrial power or of gas used in manufacturing processes. Contractors have to reckon with the effect on the trade of spot lots of gas coal offered at tempting prices, though the offers are not so common as to involve any marked dislocation. Reliance is still placed to a considerable extent on the export trade for the stabilization of the home market.

With the closing-down of more blast-furnaces and the intermittent working of other departments of the iron and steel industry, the outlook causes misgiving. It is believed that a readjustment of the blast-furnace coke price is imminent. A conference which took place last week between representatives of the Midland furnaces and their suppliers was without result, and eventually a short adjournment was agreed to.

Meter Thefts at Buxton.—At Buxton Police Court, last Friday, Claude Grimshaw was charged with stealing £1 18s. 7d. from a gas-meter in the dwelling-house of Mr. Cross, and further with stealing £1 7s. 11d. from a meter at the house of Mr. Gratton, where defendant occupied rooms. The Magistrates passed a sentence of one month's hard labour in each case; the sentences to run consecutively.

Bradford Public Lighting Centenary.—Sept. 16 was the centenary of the first use of gas as an illuminant in the streets of Bradford. While gas street lighting was adopted in Pall Mall as far back as 1807, and a number of provincial towns used it before 1820, Bradford was slow to accept the invention, which has since proved such a great boon. There is to-day very little electric street lighting in Bradford; gas being the general illuminant.

Ascot Capital Over-Subscribed.—The tenders were last week opened for the £15,000 of 6 p.ct. preference capital which Messrs. A. & W. Richards offered for the Ascot District Gas and Electricity Company, in the form of £10 shares (as advertised in the columns of the "JOURNAL"). The issue was more than twice covered; the tenders accepted ranging from £11 down to £10 5s. per share. The average price obtained for the issue was £10 9s. 6d. per share.

Camborne Gas Company.—"Rates and taxes amount to £916, which represents 8¾d. per 1000 c.ft. of gas sold," remarked Mr. J. R. Rowe, Chairman of the Camborne Gas Company, at the annual meeting. Mr. W. Bryant (a Director) said there was no hope of their getting any relief from the rates for some time. They were now paying about £900, as compared with £300 or £400 in pre-war times. This placed a great burden on the Company, as well as on other industrial concerns. Mr. S. J. Ingram, of Truro (Consulting Engineer), said the rates and taxes amounted to 50 p.ct. more than the sum divided among the shareholders. It was hopeless to think the public could get cheaper gas as long as the Company had to bear such indirect burdens, and over which they had no voice as to the distribution. A dividend of 4 p.ct. was declared. Reference was made to the death of Mr. T. H. Cadwell, who for five years had been a capable and impartial Chairman.

TRADE NOTES.

Coalite Plant for Japan.

Low-Temperature Carbonization report that an order has been received through Messrs. Takata & Co., of Tokyo, on behalf of the Japanese Government, for a smokeless fuel plant for the manufacture of coalite and bye-products of coal.

Hulett Specialities.

An illustrated price-list received from Messrs. D. Hulett and Co., Ltd., of Nos. 57 and 58, Chancery Lane, London, W.C., deals with their service cleansers and syphon pumps; patent wall supports for meters and boiling rings; the "Hulo" superheated indoor lamps; and Hulett's "9882" shade light. These goods are already well known and popular in the gas industry.

Burners (1921), Ltd.

All about the "Efficient" series of incandescent burners, lamps, fittings, and conversion sets is to be found in the new season's catalogue of Burners (1921), Ltd., of Stoke Prior Mill, Bromsgrove. The "Efficient" burner is to be had in several types, all attractive in appearance, and possessing advantages which are set forth in the list. The firm offer an inverted burner and bracket combined; also a specially-designed slot installation maintenance burner, and the "Therm" minor burner (for bathrooms, passages, &c.), with a consumption of 1 c.ft. per hour.

Davis Geysers.

A freshly issued catalogue of the Davis Gas-Stove Company, Ltd., contains full particulars of new designs of geysers, as well as of various already well-known and deservedly popular patterns. For Davis geysers generally the features are claimed of simplicity, economy, and reliability, with all their attendant advantages. There are Davis interlocking taps, which prevent the gas being turned on before the water; and a "safety-first" valve (designed primarily for cases where the gas for a geyser is being obtained through a slot meter, which may run out while the geyser is being used) can be adapted to be fitted to a number of the patterns. In the design of the Davis "Rose" and "New Shamrock" sealed types, and the "New Thistle" open type, the matter that has received special consideration has been the question of maintenance. In all cases the inner parts of the apparatus are readily accessible.

Pwllheli Gas Price Reduced.—Pwllheli gas consumers have been notified by the Holyhead and North Wales Gas and Water Corporation that the price charged them for gas will be reduced as from the September quarter from 6s. to 5s. 8d. per 1000 c.ft., but gas through slot-meters will be 1d. per therm additional to this price.

CURRENT SALES OF GAS PRODUCTS.

Tar Products in the Provinces.

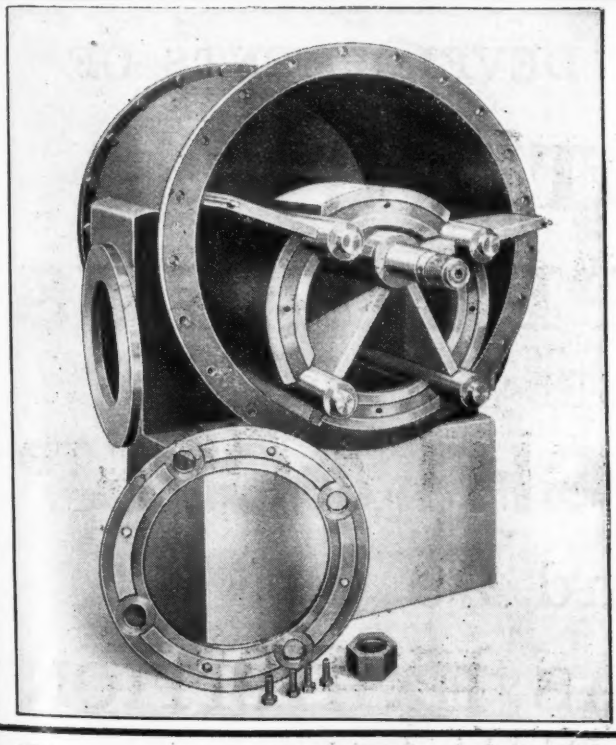
Sept. 24.

Markets for tar products have been quiet during the past week, and there has not been very much business doing. Pitch is again easier, but without any considerable amount of business having passed. It is evident that buyers are still holding their hands; and it remains to be seen what will happen when they really come into the market. At present, the price for pitch is dwindling away solely from lack of demand. White products are neglected, and low prices talked of for naphtha. Creosote is steady, and the demand appears to be fully equal to the supply. Carbolic acid is steady, and it is reported that sales have again been made to the Continent. Refined naphthalene is quiet; but for crude naphthalene there is a fair demand.

The average values for gas-works products during last week were: Gas-works coal tar, 73s. to 78s. Pitch, East Coast, 125s. to 127s. 6d. f.o.b. West Coast—Manchester, 122s. 6d. to 125s.; Liverpool, 123s. 6d. to 126s.; Clyde, 123s. 6d. to 126s. Benzole 90 p.ct., North, 1s. 2½d. to 1s. 3½d.; crude 65 p.ct. at 120° C., 10d. to 10¼d. naked at makers' works; 50-90 p.ct., naked, North, 1s. 5d. to 1s. 7d. Toluole, naked, North, 1s. 7d. to 1s. 8d. nominal. Coal tar crude naphtha in bulk, North, 8d. to 8¼d. Solvent naphtha, naked, North, 1s. 2½d. to 1s. 4d. Heavy naphtha, North, 1s. 5¼d. to 1s. 7½d. Creosote, in bulk, North, liquid, 8d. to 8½d.; salty, 7½d. to 8d.; Scotland, 6¾d. to 7½d. Heavy oils, in bulk, North, 8½d. to 9d. Carbolic acid, 60 p.ct., 3s. 4d. to 3s. 5d. prompt. Naphthalene, £15 to £16; salts, £6 to £8, bags included. Anthracene, "A" quality, 4d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

Last winter Pelsall decided to do without public lighting, as a protest against what they considered to be the exorbitant charges suggested by the Wallsall Corporation Gas Department. The price quoted last year was £4 9s. per lamp, which, after protest, was reduced to £4 4s. 6d. It was now reported that the price this year would be £4; and this tender was, at a meeting of the local Council, accepted. It was remarked that "they had had enough of darkness in Pelsall."

A new branch of the British Oxygen Company, Ltd., at a point between Stockton and Billingham-on-Tees, was opened last Wednesday, when a demonstration was given of oxy-acetylene metal cutting and welding. The idea of the Company is to secure a direct supply of oxygen for the district, and thus save the cost of carriage from the nearest branch at Newcastle-on-Tyne. The new branch is capable of furnishing the demands of the whole of Teesside. In addition to manufacturing oxygen and supplying metal cutting and welding plant, the firm will undertake the cutting and welding of any particular class of work which offers difficulties to their customers.



AN INTERESTING PHOTOGRAPH TAKEN IN OUR FITTING SHOP.

LATEST IMPROVEMENTS IN EXHAUSTERS.

R. & J. DEMPSTER, LTD., MANCHESTER.

London Office: 34, VICTORIA STREET, WESTMINSTER, S.W. 1.

Theft from a Gas Company.

Donovan Eric Bourne, of Loftus in Cleveland, was at Gisborough sent to prison for six months in the second division on a charge of having defrauded the Cleveland Gas Company, of Skelton and Skinningrove, of £1400 [*ante*, p. 874]. Prisoner was employed by the Company as clerk and bookkeeper. It was stated that other counts previously mentioned were only incidental; and the prosecution would be satisfied if the main charge was dealt with. Bourne, said the prosecuting Solicitor, had been in the Company's employment since 1915, with a break of two years when he was in the army. His salary was £200 a year. It was a small Company—only the Manager, prisoner, and a girl being engaged in the office. Until eight or nine months ago the Manager had looked after the cash and seen that it was banked. Latterly, however, the control of the cash had been entrusted to the accused, in whom the Manager had placed implicit confidence, and over whom he exercised practically no supervision. An arrangement with regard to the disposal of copper gave rise to the opportunity for the theft. When the Company's bank was surfeited with copper, the remainder was taken by the Company's servant to a second bank; and the second bank returned to the depositor notes to the amount handed in. These notes should have been taken to the Company's bank, and placed to the Company's credit. Bourne, however, had put them into his own pocket. Accused had delayed detection by making two entries in the bank pass-book, when pressed to produce it for the half-yearly audit. When discovered, Bourne said he had been gambling. He admitted the charge.

British Gas Light Company, Ltd.—At the annual general meeting to-day, the Directors, in submitting the report and accounts for the year ended June 30, will report that, after providing for interest on debentures and debenture stock, the net revenue amounted to £48,184, which, with the undivided balance brought forward from the preceding year, left an available balance of £107,167. From this sum the Directors have paid the dividend at the rate of 7 p.ct. per annum on the cumulative preference shares and an interim dividend at the rate of 5 p.ct. on the ordinary shares. They now recommend that the payment of the above dividends be confirmed, and that a final dividend on the £10 "A" ordinary shares (into which the £20 ordinary shares have now been sub-divided) at the rate of 6 p.ct. (less income-tax), making 11 p.ct. for the year, be paid on Oct. 5. This will amount to £26,077, and leave a balance of £52,715 to be carried forward. The quantity of gas sold was 3·24 p.ct. less than in the year to June, 1922. An Order under section 1 of the Gas Regulation Act, 1920, has been granted by the Board of Trade for the Hull Station; and gas is now being sold at the whole of the Company's stations on the therm basis. The transfer of the Staffordshire Potteries Station to the Stoke-on-Trent Corporation was dealt with in the Directors' report last year. The final payment mentioned as having been due from the Corporation was made on Dec. 8, and amounted, with accrued interest, to £60,978.

Proposed Gas-Fitting Ordinance in Baltimore.

Dr. J. H. Schrader, of the Baltimore Health Department, in the course of a recent discussion, referred to a proposed public ordinance, which he said it was intended should prohibit the use of appliances in such a way as to produce carbon monoxide. It would also prohibit gas-fitters from making installations of appliances until they were registered with some agency which certified to their knowledge and ability, just as master plumbers were registered; and it would prevent the use of gas tubing not authorized. The details of the ordinance would be submitted for review to a general conference of gas men, appliance men, public service commissions, and representatives from Washington and Baltimore. The practical enforcement would also be considered. A plan must be provided for testing these appliances. Ordinances of this character from over sixty cities had been compared. They were all more or less successful. New Orleans was agitating the matter, Ohio was considering a law, Massachusetts was preparing a State-wide law, and western cities had had the matter up for some time; but they had not gone into the facts as exhaustively as Baltimore. It would cost something to put in operation such safety measures; and that must be considered.

Buxton Gas Profits.—In the annual abstract of accounts issued by the Buxton Borough Treasurer, an interesting reference is made to the gas undertaking. It is stated that on the gas-works fund the gross surplus on the year's working amounted to £9842, as against £6497 for the previous year. The net profit was £7492; and the balance of the reserve and renewals fund at the close of the year was £5575. The total capital expenditure was £80,029, in respect of which £9800 loan debt is outstanding.

Padiham Carbonizing Plant.—The Padiham Gas Department propose reconstructing their carbonizing plant. To secure the most suitable system for their works, the Gas Committee are visiting various establishments in the district, and inspecting types of retorts. They have visited the Oswaldtwistle Gas-Works, where the Engineer (Mr. J. H. Davies) had to construct a new plant. With their present system, Oswaldtwistle sell gas at 1s. 5d. per 1000 c.ft. for power purposes, and 2s. 7d. net to ordinary users. Padiham gas costs 3s. 6d. per 1000 c.ft.

Chesterfield Gas Exhibition.—In connection with the Chesterfield Shopping Week, a successful gas exhibition was held, which it was hoped would be the means of further popularizing gas in the home for lighting, cooking, and heating purposes. The exhibition was opened by the Duke of Devonshire; and the Mayor (Alderman G. Clark), who is Chairman of the Gas Committee, said the undertaking was making very satisfactory headway. The output last year was 320 million c.ft.; and the area of supply extended over 50 square miles, covering a population of 70,000. The management was sufficiently successful last year to enable the Gas Committee to reduce the price of gas to 3s. 2d. per 1000 c.ft. from Oct. 1 next.

FOR THE LATEST DEVELOPMENTS OF

GAS TESTING APPARATUS

SEE

ALEX. WRIGHT & Co. LTD.

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NATIONAL GAS EXHIBITION BIRMINGHAM

September 17th—October 3rd, 1923

STOCK MARKET REPORT.

THERE were no disturbing factors, such as occurred in the two previous weeks, to affect prices on the Stock Exchange last week. Orders were unusually small, and business generally was dull. Gilt-edged investments were comparatively neglected, and there were only slight fluctuations in the British Government stocks. On the favourable interpretation of the meeting of the two Premiers in Paris, the result of which it would not be wise to be too optimistic. French nationals advanced slightly, and the Foreign Market hardened generally. In the Miscellaneous Market, Teas were in demand, as was the case with Oil at the close of the week; but Rubbers were slack. Changes took place in the Gas Companies' quotations. British "A," Hastings and St. Leonards 3½ p.ct. rose; while Hastings and St. Leonards 5 p.ct. *ex* div., Maidstone 5 p.ct., *ex* div., Newcastle and Gateshead consolidated, and Sheffield "C" fell.

The following transactions during the week were recorded: On Monday, Alliance and Dublin ordinary 71⅞, 75, Bombay 5⅛, Commercial 4 p.ct. 95½, European 7½, 7⅞, Gas Light and Coke ordinary 97¼, 97½, 97⅝, 4 p.ct. consolidated preference 81⅛, 81⅜, 3 p.ct. debenture 62½, Imperial Continental 162, 163½, Primitiva 4 p.ct. debenture 1911 57, South Metropolitan 98⅞, 3 p.ct. debenture 62½, 63½, British "B" 12, 12¼, Folkestone 79½, Malta and Mediterranean 1st 7 p.ct. preference 95⅝. On Tuesday Aldershot 4 p.ct. consolidated preference 74½, 75, Alliance and Dublin 70½⅛, British "A" 12½, 12⅛, 13⅛, European 7⅛, Gas Light and Coke 97, 97½, 97¼, 97½, 97⅝, 3½ p.ct. maximum 66, 4 p.ct. consolidated preference 82, 3 p.ct. debenture 63, Imperial Continental 162, Portsea Island 10 p.ct. "A" 113½, *ex* div. Primitiva (Buenos Ayres) 4 p.ct. new debenture 57, 57⅛, South Metropolitan 98½, 98⅝, Tottenham "B" 3½ p.ct. 103, 104, Wandsworth (Wimbledon) 5 p.ct. 113, Brighton and Hove 6 p.ct. "B" preference 107, British "B" 11⅞, 12, 12½, 12¼, Folkestone 79, Wandsworth 3½ p.ct. new 102½, 103. On Wednesday, British "A" 13⅛, Commercial 3 p.ct. debenture 60⅞, 61⅛, Gas Light and Coke 4 p.ct. 97, 97¼, 97⅛, 97⅜, 3½ p.ct. maximum 66½, 4 p.ct. consolidated preference 82, 3 p.ct. debenture 62½, Imperial Continental cap. 162, South Metropolitan 98¼, British "B" 12½, 3½ p.ct. maximum debenture 60. On Thursday, Alliance and Dublin ordinary 75, Cape Town 7½, Gas Light 4 p.ct. 97⅛, 97⅜, 97⅛, 97⅝, 3½ p.ct. maximum, 66, 66⅛, 4 p.ct. consolidated preference 82, 3 p.ct. consolidated debenture 62½, Imperial Continental cap. 162, 163½, 3½ p.ct. debenture 76⅝, Montevideo 50, Primitiva 6s., 7s., 4 p.ct. 1st debenture 71, South Suburban ordinary 5 p.ct. 101½, Tottenham and District 3½ p.ct. "B" 103, Metropolitan of Melbourne 7 7/16, 7½, Reading 5 p.ct. maximum 81½. On Friday, Aldershot 4 p.ct. consolidated preference 74, Alliance and Dublin 71 9/16, Bombay 5⅛, 5⅜, Brentford "A" 4 p.ct. 102½, 102½, 103, "B" 3½ p.ct. 102, 102½, 103, Commercial 4 p.ct. 96¼, 96⅜, 97, 3½ p.ct. 95⅛, Gas Light and Coke 4 p.ct. 97⅜, 97 3/16, 97⅝, 3½ p.ct. maximum 65½, 4 p.ct. consolidated preference 82½, 3 p.ct. debenture 62½, Hastings and St. Leonards 80½ *ex* div., Oriental cap. 100, South Metropolitan 98½, British "B" 12⅜, Swansea 5 p.ct. maximum 84½, 84⅝.

The optimism of the Foreign Market was reflected in the Foreign Exchange, French and Belgian francs and Italian lira improving slightly.

In the Money Market there was a good demand for short loans. Borrowers paid up to 3 p.ct. for the night. In spite of the firmness of money rates, discount quotations were easier. The cash price of silver rose gradually during the week, and on Friday, owing to the extensive demand from India, reached the figure of 32⅜d. The Bank of England rate is 4 p.ct., as fixed on July 5.

PRE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S TRANSACTIONS.

Issue.	Share.	When ex-Dividend.	Ante-War Dividend & Bonus.	Last Divid. at Rate of	NAME.	Closing Prices, July 30, 1914.	Variation. Present Quotations.	Variation. Lowest and Highest Prices of Transactions.
£			p.c.	% p.a.	Aldershot 5 p.c. max. C.	..	72—77	...
131,978	Stk.	Aug. 9	—	5	Do. 4 p.c. Pref.	..	70—75	74—75
190,492	,,	,, Apl. 5	4	4	Alliance & Dublin Ord.	59—64	72—77	70 1/8—75
1,551,868	,,	July 12	4	5	Do. 4 p.c. Deb.	76—79	62—67	...
374,000	,,	May 17	7½	4	Bombay, Ltd.	5⅛—6⅛	5⅛—5⅜	5⅛—5⅜
280,000	5	Aug. 9	16	8		..	11⅜—12⅜	...
100,000	10	,,	7	8½	Bournemouth Gas and Water { 5 p.c.	15—15⅛	11⅜—12⅜	...
383,110	10	,,	6	7	B 7 p.c.	13⅜—14	10⅜—11⅜	...
115,000	10	June 28	—	6	Pref. 6 p.c.	..	77—82	...
162,025	—	July 12	14	4	4 p.c. Deb.	261—266	100—105	102½—103½
992,045	Stk.	,,	11	6 1/10	Brentford A Consolid.	204—209	100—105	102—103
734,920	,,	,,	5	6⅛	Do. B New	109—111	83—88	...
55,000	,,	,,	5	5	Do. 5 p.c. Pref.	91—93	77—82	79
121,400	,,	June 14	4	4	Do. 4 p.c. Deb.	208—213	171—176	...
214,745	,,	Aug. 23	11	11½	Brighton & Hove Orig.	154—159	127—132	...
244,200	,,	,,	8	8½	Do. A Ord. Stk.	..	90—93	...
1,387,500	Stk.	July 26	5	5	Bristol 5 p.c. max.	44—45	12⅜—13⅜	12¾—13⅜
570,000	20	Mar. 22	12½	10	British A Ord.	..	11⅜—12⅜	...
100,000	10	June 28	—	7	Do. 7 p.c. Pref.	..	75—80	...
120,000	Stk.	,,	4	4	Do. 4 p.c. Deb. Stk.	88—90	6⅜—7⅛	7⅛
100,000	10	May 17	—	7	Do. 4½ p.c. Deb. Stk.	1⅛—2⅛	6—7	...
100,000	10	May 3	—	4½	Cape Town & Dis., Ltd.	4—6	70—75	...
150,000	Stk.	June 28	4½	4½	Do. 4½ p.c. Pref.	70—75	106—111	...
237,860	,,	,,	—	7⅛	Cardiff 7½ p.c. Deb.	..	..	...
157,150	,,	Feb. 26	5	5	Chester 5 p.c. Ord.	108—110	95—98	95¼—97
1,513,280	,,	July 25	5/9/4	6	Commercial 4 p.c. Stk.	106—108	95—95⅜	95⅛
560,000	,,	,,	5⅛	6	Do. 3½ p.c. do.	103—105	60—64	60⅞—61⅛
475,000	,,	June 14	3	3	Do. 3 p.c. Deb. Stk.	69⅛—71⅛	33—38	...
800,000	,,	14 Jan. 15	4	—	Continental Union, Ltd.	76—79	72—77	...
200,000	,,	Dec. 14	7	4	Do. 7 p.c. Pref.	115—118	101—104	...
660,000		Aug. 9	—	6⅛	Croydon sliding scale.	..	81—85	...
284,975	Stk.	,,	—	5	Do. max. div.	..	..	...
492,270	,,	,,	6	4⅛	Derby Con. Stk.	123—125	..	...
55,000	,,	,,	—	4	Do. Deb. Stk.	102—104	..	...
209,000	,,	Apl. 5	4	5	East Hull 5 p.c. max.	..	..	...
1,002,180	10	July 12	—	5	European, Ltd.	17⅛—18	7⅛—8⅛	7⅛—7⅜
16,346,120	Stk.	July 26	10	5	Gas Light and Coke { 4 p.c. Ord.	98—102	96—98	97—97⅛
2,600,000	,,	,,	4/17/4	5⅛	3½ p.c. max.	76—79	65—68	65⅛—66⅛
4,062,235	,,	,,	3⅛	3½	4 p.c. Con. Pref.	96—99	80—83	81⅛—82⅛
4,761,930	,,	June 14	4	4	3 p.c. Con. Deb.	72⅛—74⅛	61—64	62⅛—63
130,000	,,	Dec. 11	3	3	10 p.c. Bonds	..	..	...
42,000	—	,,	10	7⅛	7½ p.c. Ilford Deb.	..	..	...
84,500	,,	Sept. 19	—	6⅛	Hastings & St. L. 5 p.c.	..	93—98*	80½xd.
258,740	,,	,,	5	5⅛	Do. 3½ p.c.	87—89	78—85*	...
70,000	10	,,	3½	10	Hongkong & China, Ltd.	16⅛—16⅜	15—16	...
86,600	Stk.	May 17	11	9½	Hornsey 7 p.c.	..	144—149	...
1,976,000	,,	Aug. 23	9	17	Imperial Continental	150—160	160—165	162—163½
404,800	,,	May 31	9	3½	Do. 3½ p.c. Deb. Red.	84—86	76—78	76⅞
233,242	,,	Aug. 9	3½	6⅛	Lea Bridge Ord. 5 p.c.	119—121	95—100	...
6,495,905	,,	,,	6⅛	5⅛	Liverpool 5 p.c. Ord.	..	..	...
600,000	,,	Feb. 26	10	7	,, 7 p.c. Pref.	..	103—106*	...
165,736	,,	Sept. 19	—	7	Maidstone 5 p.c.	..	104—109	...
63,480	,,	Aug. 23	7/5/6	4⅛	Do. 3 p.c. Deb.	—	52—57	...
75,000	5	June 28	—	—	Malta & Mediterranean	..	3⅛—4	...
75,000	5	June 14	6	7	Met. of Melbourne 4½ p.c. Deb.	4⅛—4⅛	97—100	...
50,000	100	Apl. 3	4½	4½	Montevideo, Ltd.	99—101	49—54	50
341,920	Stk.	May 17	4	4	Newcastle & Gatsh'd Con.	11⅛—12	83½—84½	84
1,875,892	,,	July 26	4⅛	4⅜	Do. 4 p.c. Pref. Stk.	98⅛—99⅛	74⅛—76⅛	...
250,166	,,	Aug. 9	—	4	Do. 3½ p.c. Deb.	82—83	71—73	...
389,705	,,	June 28	3⅛	3½	North Middlesex 10 p.c.	..	16⅛—17⅛	...
15,000	10	Aug. 23	—	11	,, ,, 7 p.c.	14—15	11⅛—12⅛	100
75,940	10	,,	7/14/0	7 1/10	Oriental, Ltd.	117—122	97—102	...
300,000	Stk.	May 3	8	7	Plym'th & Stonh'se 5 p.c.	..	108—113	...
188,120	Stk.	June 28	—	7⅛	Portsea Island, B	128—131	100—105	...
60,000	50	Sept. 6	13	13	Do, C	118—121	97—102	6/—7/-
100,000	50	,,	12	12	Primitiva Ord.	5⅛—6	⅛—⅜	...
1,430,345	5	29 Oct. 14	8	—	Do. 5 p.c. Pref.	4⅛—5	1⅛—1⅜	...
2,199,800	5	30 Dec. 13	5	4	Do. 4 p.c. Deb.	91—93	70—74	71
341,400	100	June 1	4	4	Do. ,, ,, 1911	..	56—59	57
600,000	Stk.	July 26	4	4	Do. B. Aires 4 p.c. Deb.	85—87	56—59	57—57⅛
220,535	,,	June 28	4	4	Do. Riv. Pl. 4 p.c. Deb.	85—87	56—59	...
321,670	,,	,,	4	4	San Paulo { 6 p.c. Pref.	10⅛—11	5⅛—6⅛	...
150,000	10	Mar. 22	6	6	5 p.c. Deb.	47—49	38—41	...
125,000	50	July 2	5	5	Sheffield A	223—224	102—104	...
270,000	Stk.	Aug. 23	10	5	Do. B	222—224	101—103	...
419,568	,,	,,	10	5	Do. C	220—222	100—102	...
1,047,000	,,	,,	10	5	Shrewsbury 5 p.c.	..	..	...
133,201	Stk.	—	4	6	South African	10⅛—11⅛	7⅛—9⅛	...
90,000	10	May 31	9	5	South Met. Ord.	111—113	97—99	98⅛—98⅞
4,609,895	Stk.	July 26	5/4/0	5	Do. Red. Pref.	..	98—100	...
250,000	,,	July 12	—	5	Do. 3 p.c. Deb.	72⅛—74⅛	61—64	62⅛—63⅛
1,895,445	,,	,,	3	3	Do. 6⅛ p.c. Deb.	..	105—107	...
734,000	,,	Sept. 6	8⅛	6⅛	South Shields Con. Stk.	157—159	127—129	...
91,500	,,	Aug. 23	8	8⅛	S'th Suburb'n Ord. 5 p.c.	114—116	100—103	101⅛
1,087,795	,,	,,	6	6	Do. 5 p.c. Deb. Stk.	116—118	95—100	...
368,837	,,	June 28	5	5	S'th'mpt'n Ord. 5p.c. max	99—102	88—91	...
647,740	,,	May 3	5	7	Do. 4 p.c. Deb. Stk.	..	72—77	...
121,275	,,	June 28	4	4	Swansea 7 p.c. Pref. Stk.	..	102—104	...
250,000	,,	Aug. 23	—	7	Do. 6½ p.c. Deb. Stk.	..	105—107	...
200,000	,,	June 28	—	6⅛	Tottenham District { A 3 p.c.	135—138	120—125	...
120,000	,,	July 26	—	8	B 3½ p.c.	115—117	100—105	103—104
782,275	,,	,,	6	6⅛	4 p.c. Deb.	87—89	78—82	...
181,355	,,	June 14	4	4	Tynemouth 5 p.c. max.	108½—109	88—90	...
258,251	Stk.	Aug. 23	5	5	Wandsworth, Wimbledon, and Epsom—			
					Wandsworth A 5 p.c.	131—136	126—131	...
30,000	,,	July 12	8⅛	9	Do. B 3½ p.c.	129—134	112—117	...
855,636	,,	,,	6½	7⅛	Do. C.	..	98—103	102½—103
108,075	,,	,,	—	6⅛	New Ordinary	..	..	113
140,865	,,	,,	—	6 1/10	Wimbledon 5 p.c.	117—122	109—114	...
358,000	,,	,,	6½	7⅛	Epsom 5 p.c.	121—126	112—117	...
98,000	,,	,,	6½	7⅛	3 p.c Deb. Stk.	66—69	57—60	...
88,426	,,	June 28	3	3				

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Another Price Reduction at Bristol.—The attention of consumers at Bristol is drawn by the Gas Company to the fact that their gas is to be cheaper still—the total reduction since December, 1921, amounting to 1s. 6d. per 1000 c.ft. On the date named, the price was 4s. 6d. per 1000 c.ft., or 11½d. per therm; and successive reductions brought this down to 3s. 1·2d. per 1000 c.ft., or 7¾d. per therm. The seventh reduction, for gas consumed during the quarter ending Dec. 31 next, brings the price down to 3s. per 1000 c.ft., or 7½d. per therm, with the same allowances and conditions as before.

Maryborough (Queensland) Gas and Coke Company, Ltd.—The report for the half-year ended June 30 states that the City Council's electric lighting scheme came into operation in August of last year; and the half-year referred to in the report has therefore been the first full period of six months during which the Company have had competition from this source. Though the lighting consumption showed a decrease, the sales of gas for cooking purposes were in excess of the corresponding half of any previous year. In fact, the operations generally were highly satisfactory. The profits were sufficient to allow the payment of the usual dividend, at the rate of 6 p.ct. per annum, free of State income-tax, and the allocation of £200 to the reserve fund and £362 to the reserve for renewals, contingencies, and taxation.

Price Further Reduced at Melton Mowbray.—Satisfactory results were reported at the annual meeting of the Melton Mowbray Gas Light and Coke Company, Ltd. The undertaking is now on the thermal basis, with a declared calorific value of 500 B.Th.U.; and after the September meter readings gas will be supplied at 13·2d. per therm, or the equivalent of 5s. 6d. per 1000 c.ft., as compared with the existing charge of 6s. A dividend, making 8 p.ct. for the year, less tax, was declared. The Chairman (Mr. Shafto H. Sikes) said that a fine holder had been erected by Messrs. Robert Dempster and Sons, of Elland, with a capacity of 300,000 c.ft. When it was borne in mind that a year or two ago, when they were looking forward to the erection of an additional holder, the figures worked out at something like £24,000, he thought they would agree with him that the provision of the holder for £9000 was a very good move indeed. So far as could be ascertained, the work had been carried out with credit to the contractors. As to the work of the Engineer and Manager (Mr. T. M. M'Dougall), it was mentioned that the make of gas during the year averaged 12,478 c.ft. per ton of coal carbonized.

Stockton Gas Department Projects.—The Stockton-on-Tees Corporation have decided to make application for a Special Order under the Gas Regulation Act, so as to be able to proceed with two new schemes the Gas Committee have in hand. One is the purchase of the Yarm Gas Company's undertaking, and the extension of the Corporation supplying powers so as to include Wolviston, Newton Bewley, Cowpen Bewley, Elton, Long Newton, Aislaby, Ingleby Barwick, Maltby, and Yarm. The second is to vary the purpose for which land in Lucan Street may be used, and to provide for the purchase or leasing of houses and buildings for persons employed in connection with the gas undertaking. It is desired under the Order to borrow money for these schemes, and the Corporation intend further to build-up a fund by annual payments from revenue for the purpose of providing working capital. Alderman Thompson said he thought the Gas Committee were asking the Council for a blank cheque; but Alderman M'Naughton (the Chairman of the Committee) observed that the borrowing powers on the undertaking had been exhausted. When the Order was obtained, a second application would have to be made to the Ministry of Health for sanction to borrow the money; and the Council would then have the opportunity of fully considering the matter. The sum involved would be about £50,000.

Further Reduction of Price in Birmingham.—The Birmingham Gas Committee decided on Monday to reduce the price of gas, as from the September readings of the domestic meters, from 3s. 7d. to 3s. 1d. per 1000 c.ft. The reduction applies to all other sections of gas consumers, and a proportionate benefit will be given to users of prepayment slot meters. The last-named concession means from 3 to 4 c.ft. more gas per penny.

Labour Situation in America.—Writing at the end of August in the "Gas Age-Record," Mr. Floyd W. Parsons said: The death of President Harding has altered the coal outlook materially. While none of us can read the mind of our new Chief Executive, there would seem to be ground for belief that coming weeks will witness a labour struggle that will change the whole complexion of our future industrial life. While the medicine we may have to swallow will likely be bitter, there is much comfort in the knowledge that kid-glove methods will never succeed in providing us with a real remedy for our national coal muddle. If the only way to permanent fuel peace is through stormy waters, then nothing will be gained by delaying the start of the perilous journey. Whatever may be the outcome of the present difficulty, reports indicate that our gas industry has prepared for many days of tribulation; and we may at least rest easy in the thought that we have recognized our duty of service to the public in a manner that will be of practical and substantial value if the miners stop working.

A double fatality recently occurred at the New Brancepeth Colliery, near Durham. Arthur Greenwell and Frederick Underwood had been sent to clean out a tank in connection with the benzole plant. They had been engaged about an hour removing slurry from the bottom, which was some 10 ft. down, when they were found lying there dead, having been overcome by the poisonous gases which they had disturbed.

Alderman J. H. Waddington (the Chairman of the Halifax Corporation Gas Committee) was the speaker at the Huddersfield Rotary Club on Sept. 17, taking for his subject, "Why be a Councillor?" He answered his own question by emphasizing the need for service to the community, and the call for men of vision. He said the only reward for public work was more work and harder work; but it was the grandest and greatest voluntary work in which he had ever been engaged.

When the shops and stores in Walham Green were crowded with week-end shoppers last Saturday night, the electric light suddenly failed, plunging many shops and thoroughfares into darkness. There was a rush for candles; and for an hour—from 7 to 8—large stores served their customers under great difficulties. Several crowded kinemas which relied for their power on the Fulham municipal electricity undertaking had to suspend their performances. It was, however, not a general failure over the whole of the district. In some of the streets only a few establishments were affected.

The Featherstone (Yorks.) Urban Council, transferring from gas to electricity for street lighting, finds itself rather "in the cart." The Gas Company got to work quickly to disconnect the street-lamps; but the electricity people were not so brisk, and the cabling was not ready. Electric light should have been ready on Sept. 1; but it was not. The dock strike was blamed for the delay. Whatever the reason, the miles of streets were unlighted; and the Council, after making temporary arrangements for lighting main road junctions, had to appeal to local shopkeepers to keep their windows alight as long as possible after closing hours—the Council to pay the extra cost of such lighting.

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